



(12) **United States Patent**
Bradford et al.

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(54) **CONTAINER HAVING METAL OUTER FRAME FOR SUPPORTING L-SHAPED TRACKS**

(2013.01); *B65D 2519/00268* (2013.01); *B65D 2519/00273* (2013.01); *B65D 2519/00288* (2013.01); *B65D 2519/00293* (2013.01); *B65D 2519/00318* (2013.01); *B65D 2519/00323* (2013.01);

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(Continued)

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(58) **Field of Classification Search**

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USPC 220/1.6, 543, 544, 535, 534, 1.5, 533, 220/532, 528, 9.4, 495.01, 529, 507; 206/583, 533

(73) Assignee: **Bradford Company**, Holland, MI (US)

See application file for complete search history.

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 369 days.

(56)

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(65) **Prior Publication Data**

US 2014/0076755 A1 Mar. 20, 2014

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Related U.S. Application Data

(63) Continuation-in-part of application No. 13/616,635, filed on Sep. 14, 2012, now Pat. No. 9,004,307.

(51) **Int. Cl.**

B65D 25/04 (2006.01)
B65D 25/10 (2006.01)

(Continued)

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(57)

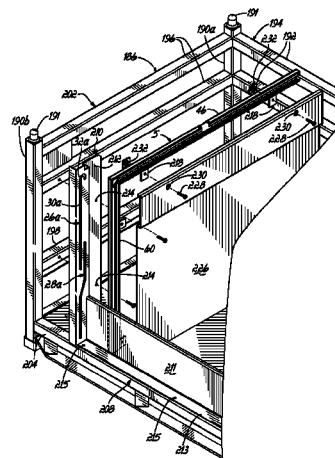
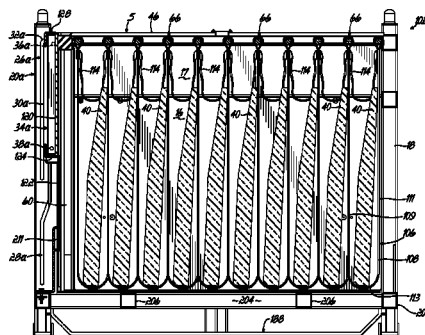
ABSTRACT

A container for holding product therein during shipment and being returned for reuse has a metal frame, tracks having horizontal and vertical portions attached to opposite sides of the frame, and a plurality of support member assemblies extending between the tracks. Each support member assembly includes end members located at the ends of a tubular support, the end members being movable in the tracks. The support member assemblies support dunnage for supporting products for storage or shipment.

(52) **U.S. Cl.**

CPC *B65D 85/68* (2013.01); *B65D 19/06* (2013.01); *B65D 19/44* (2013.01); *B65D 25/005* (2013.01); *B65D 2519/00024* (2013.01); *B65D 2519/00034* (2013.01); *B65D 2519/00044* (2013.01); *B65D 2519/00059* (2013.01); *B65D 2519/00069* (2013.01); *B65D 2519/00082* (2013.01); *B65D 2519/00164* (2013.01); *B65D 2519/00174* (2013.01); *B65D 2519/00184* (2013.01); *B65D 2519/00233*

24 Claims, 36 Drawing Sheets



- (51) **Int. Cl.**
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B65D 85/68 (2006.01)
B65D 19/06 (2006.01)
B65D 19/44 (2006.01)
B65D 25/00 (2006.01)
- (52) **U.S. Cl.**
CPC *B65D 2519/00333* (2013.01); *B65D 2519/00422* (2013.01); *B65D 2519/00497* (2013.01); *B65D 2519/00502* (2013.01); *B65D 2519/00532* (2013.01); *B65D 2519/00562* (2013.01); *B65D 2519/00611* (2013.01); *B65D 2519/00621* (2013.01); *B65D 2519/00666* (2013.01); *B65D 2519/00701* (2013.01); *B65D 2519/00805* (2013.01); *B65D 2585/6882* (2013.01); *B65D 2585/6887* (2013.01)
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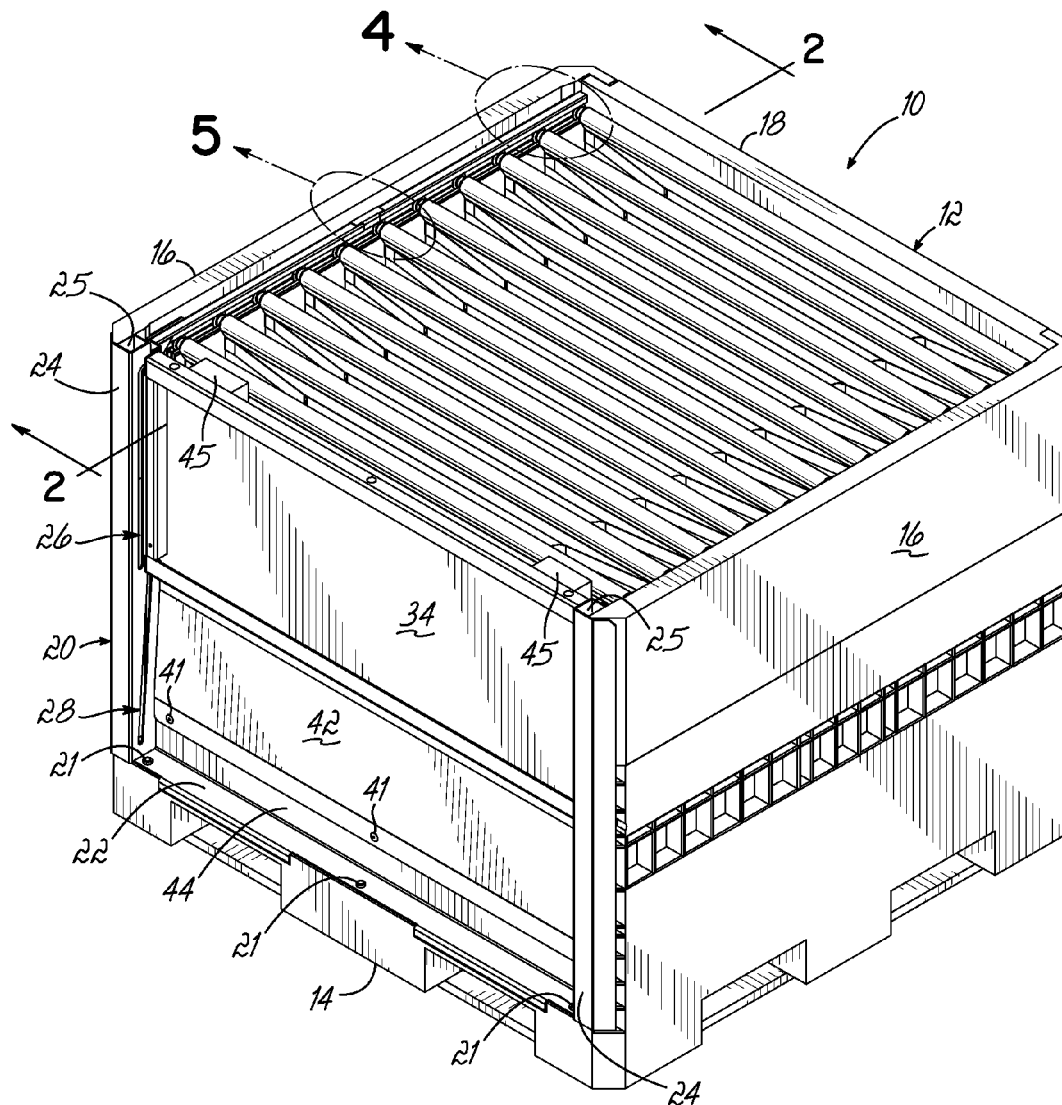


FIG. 1

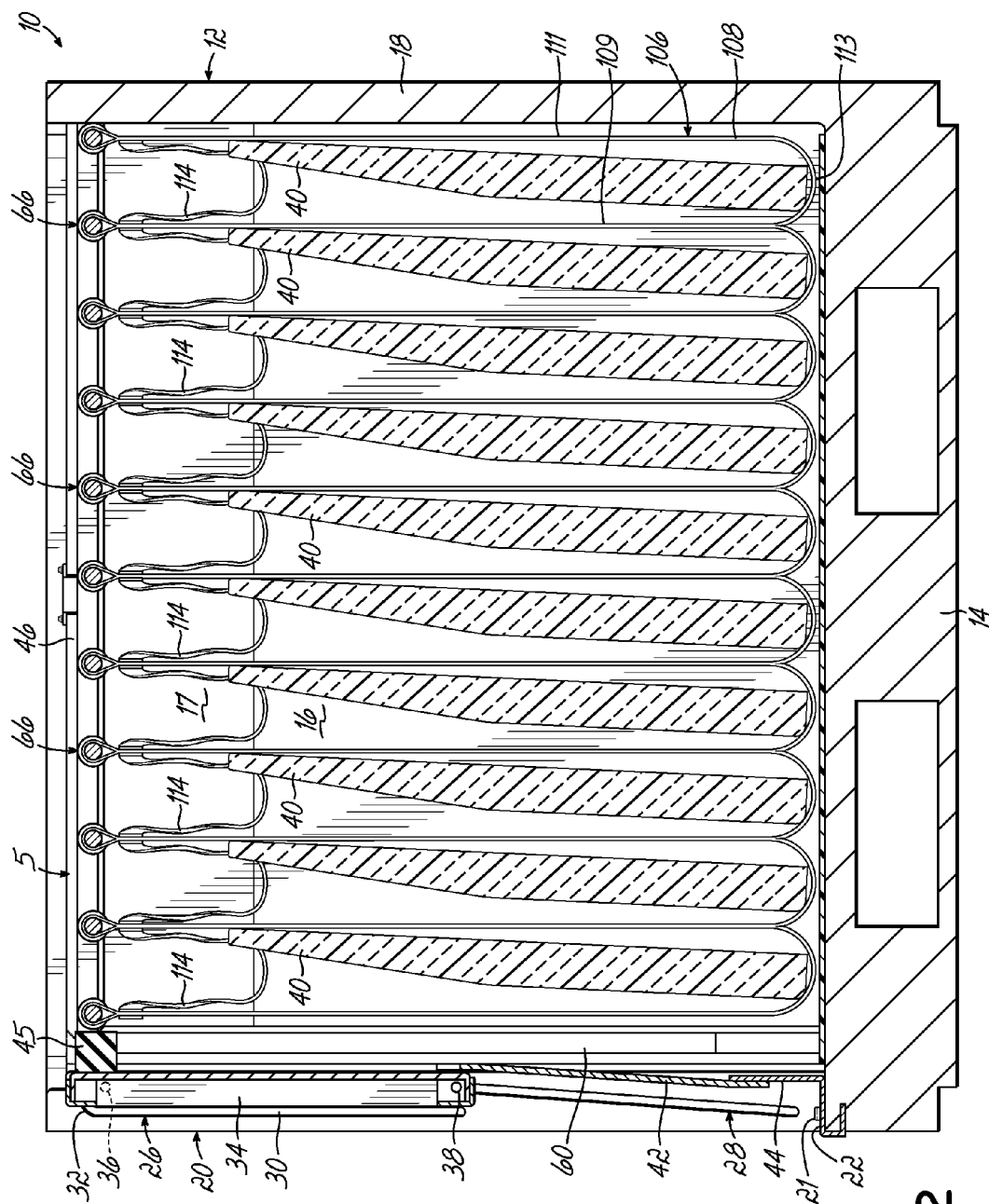


FIG. 2

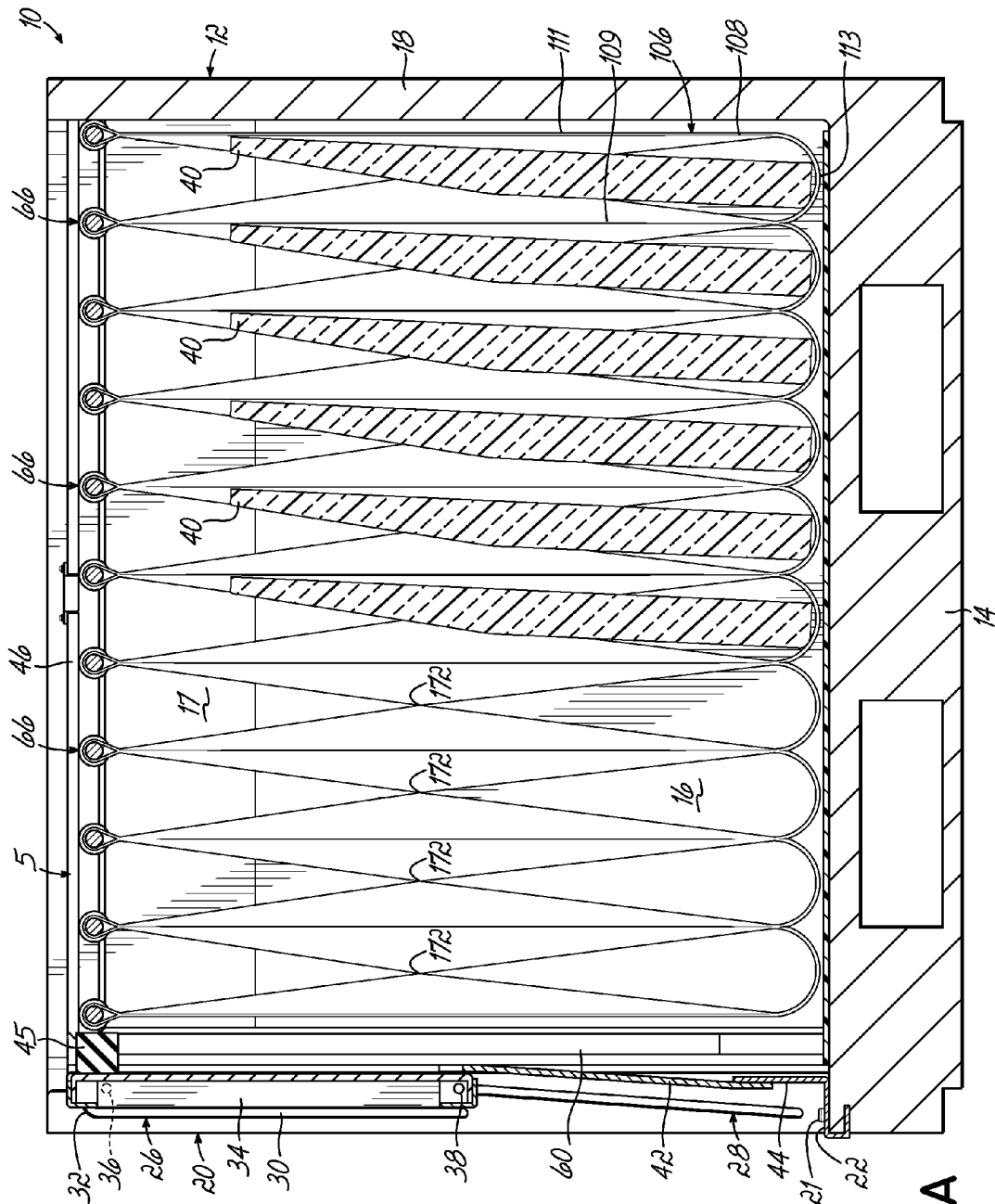


FIG. 2A

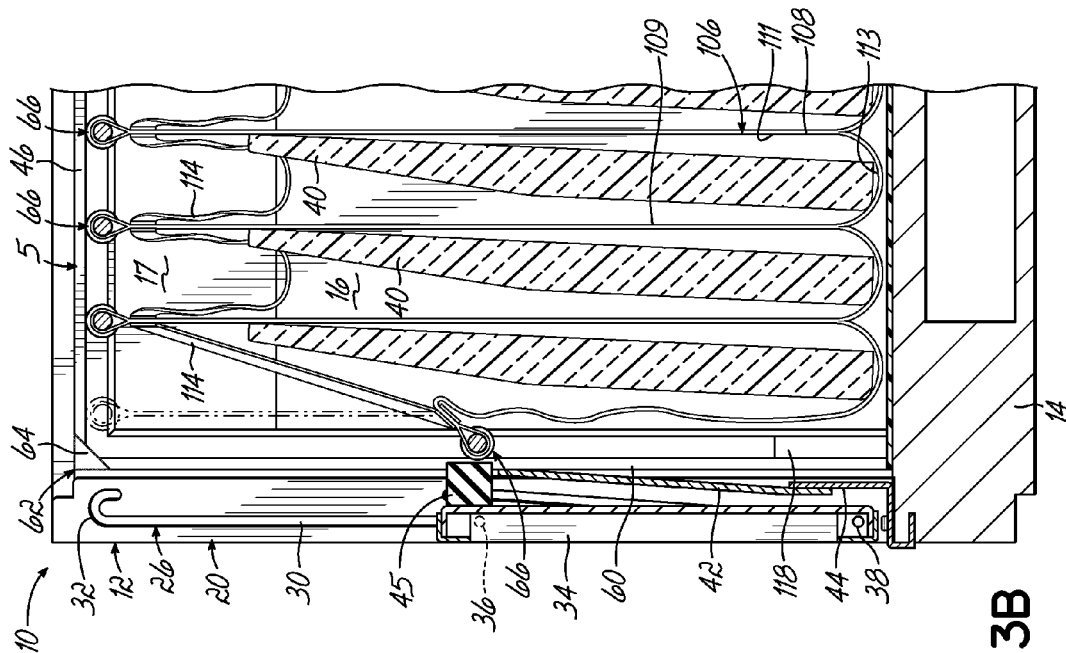


FIG. 3B

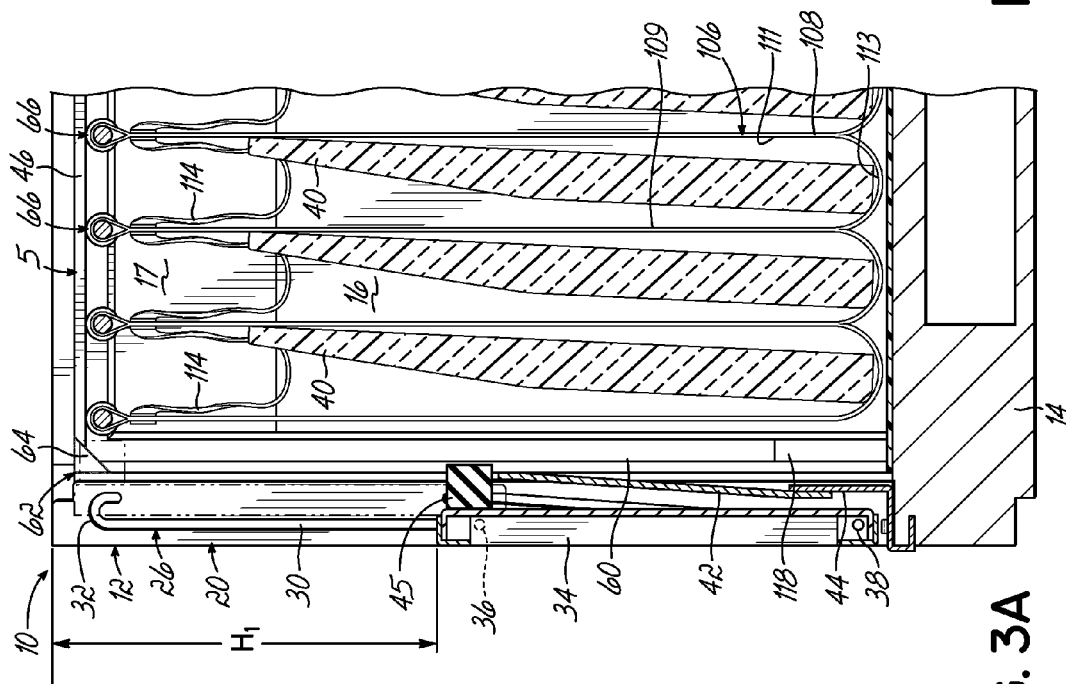


FIG. 3A

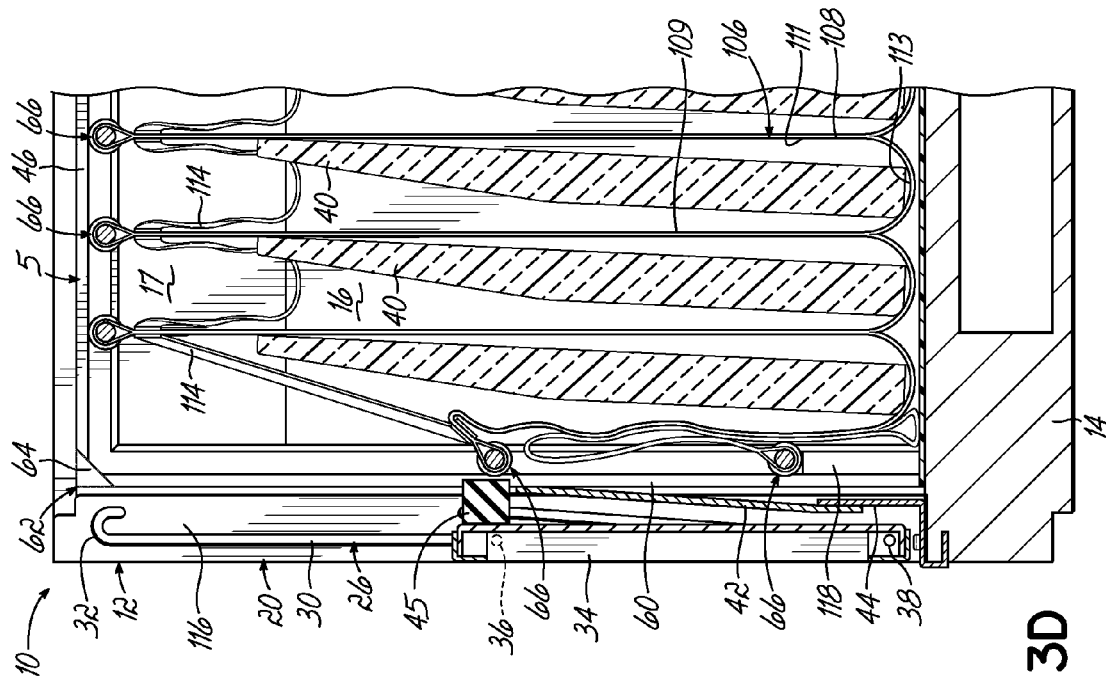


FIG. 3D

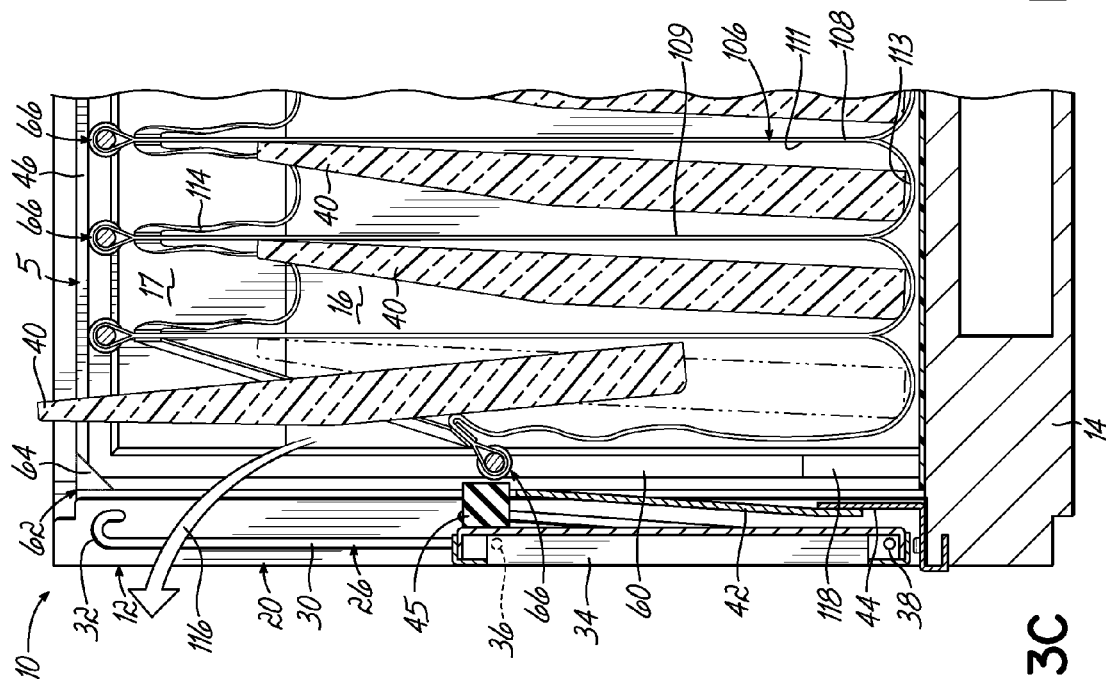


FIG. 3C

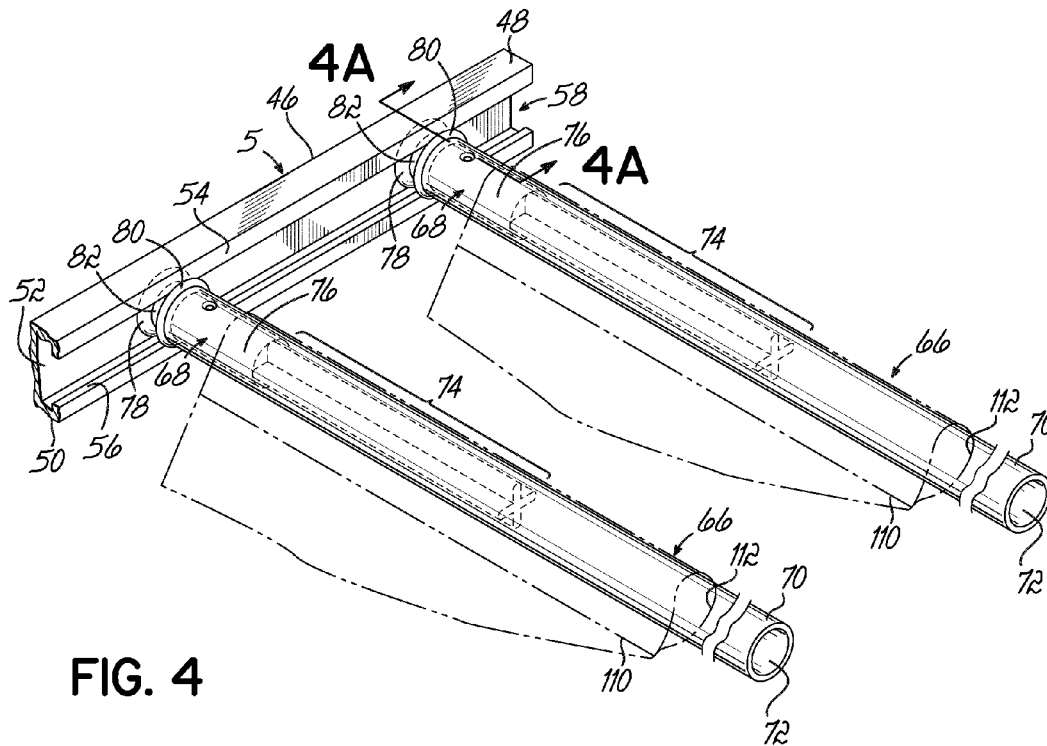


FIG. 4

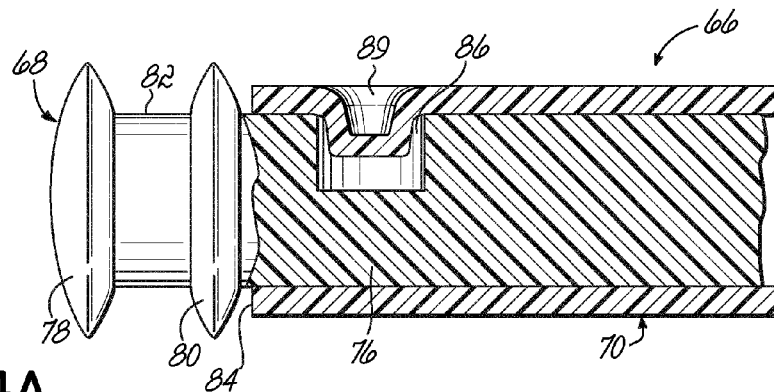


FIG. 4A

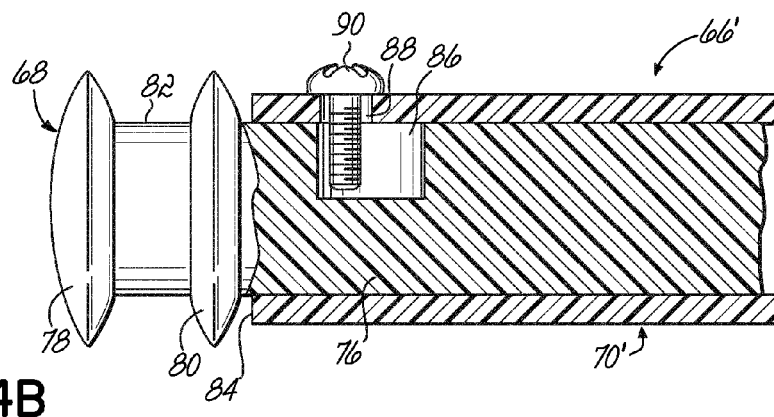


FIG. 4B

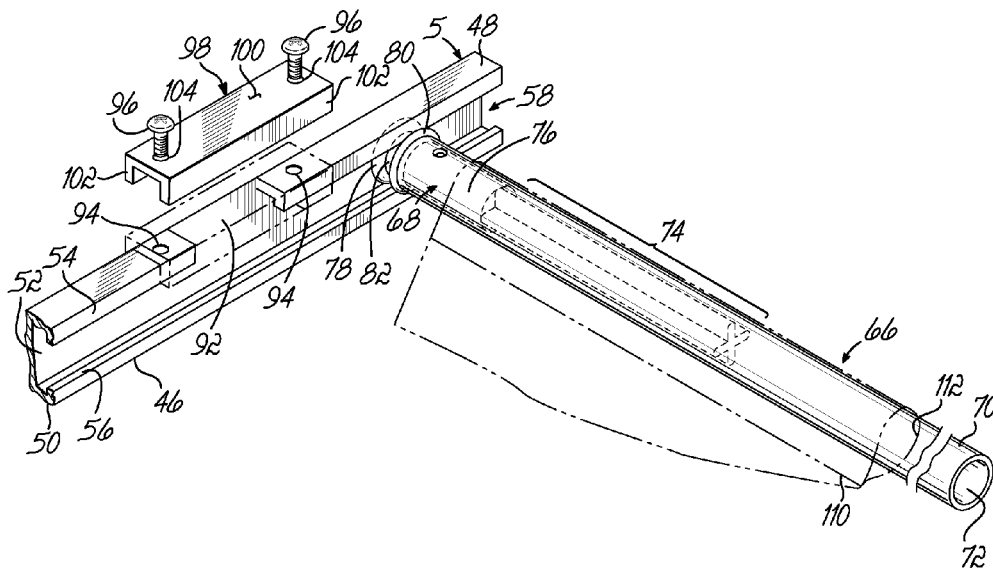


FIG. 5

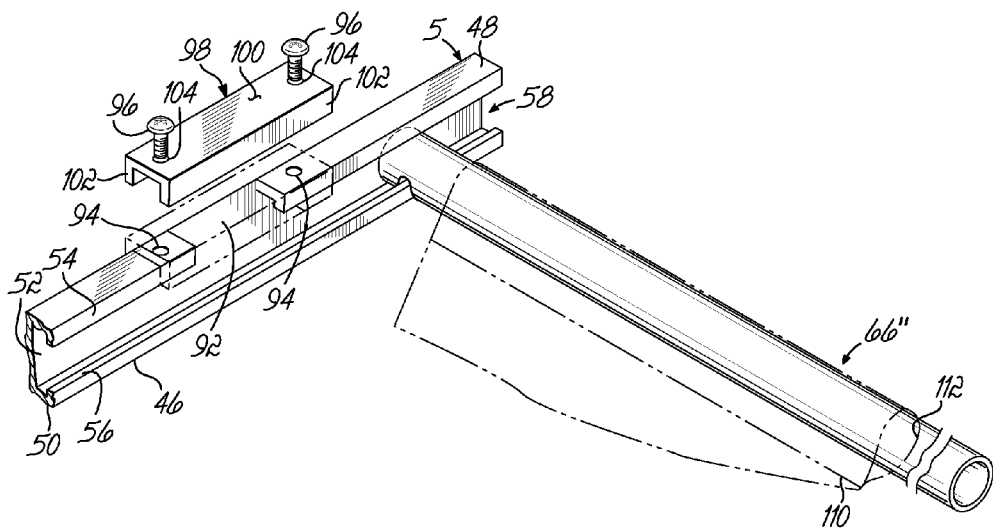


FIG. 5A

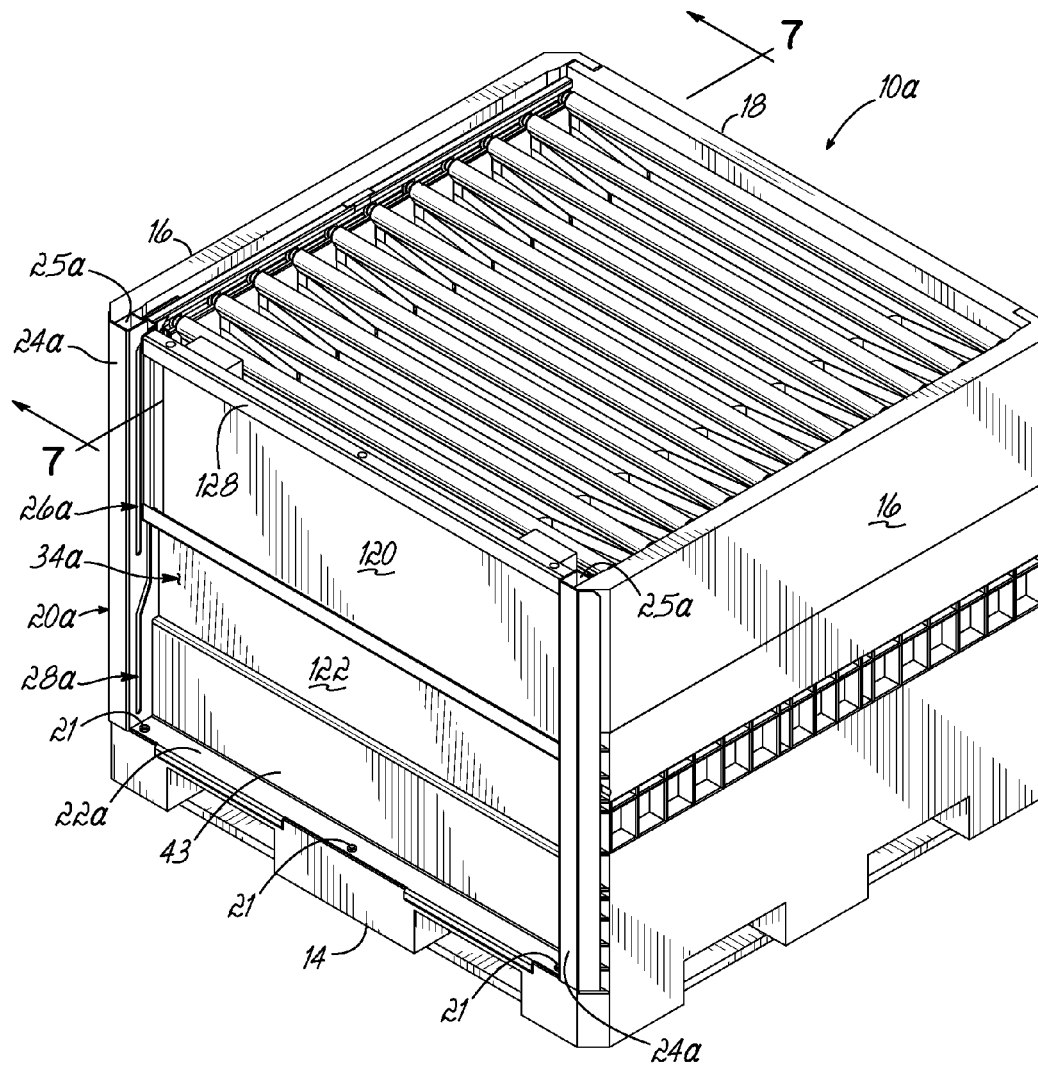


FIG. 6

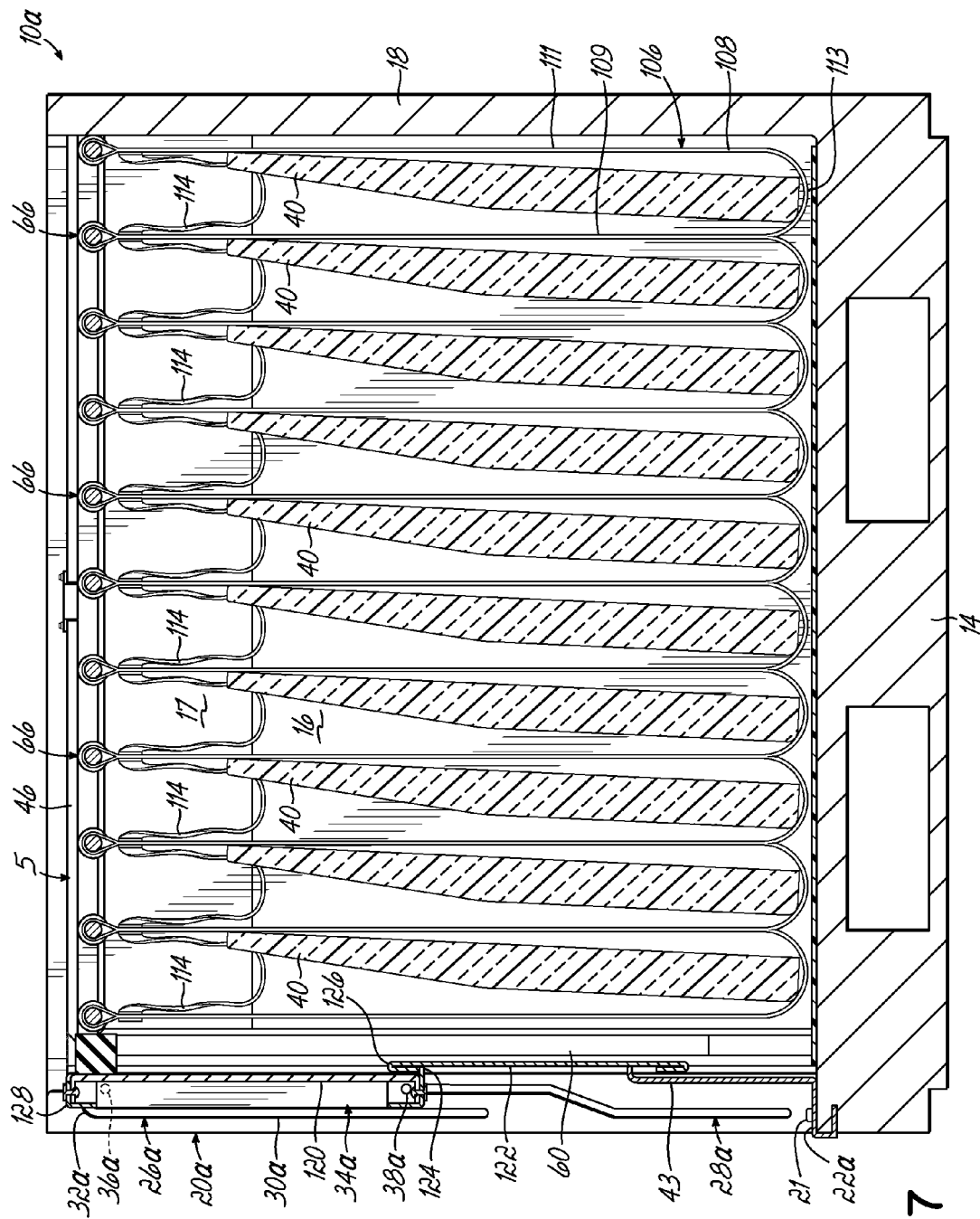


FIG. 7

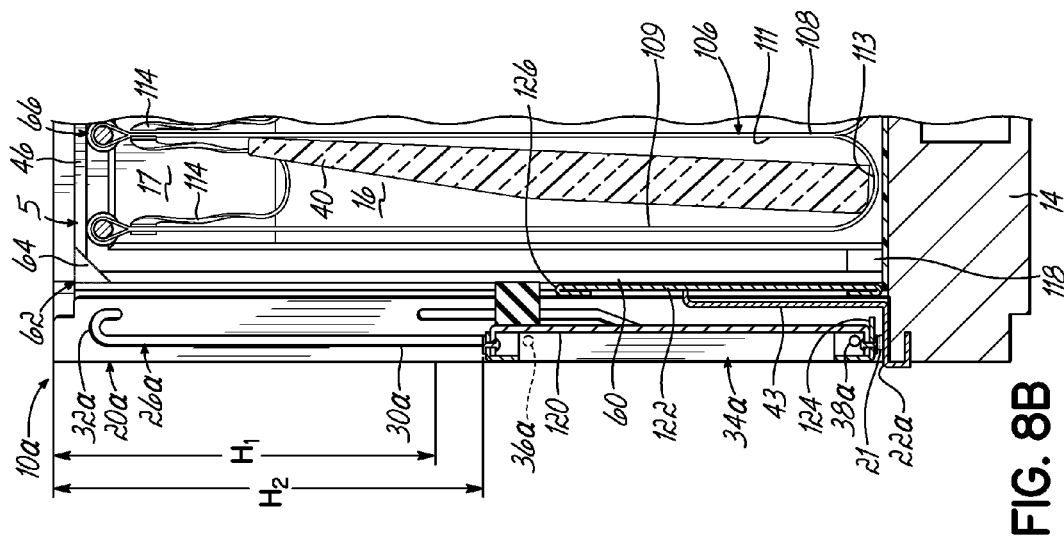


FIG. 8B

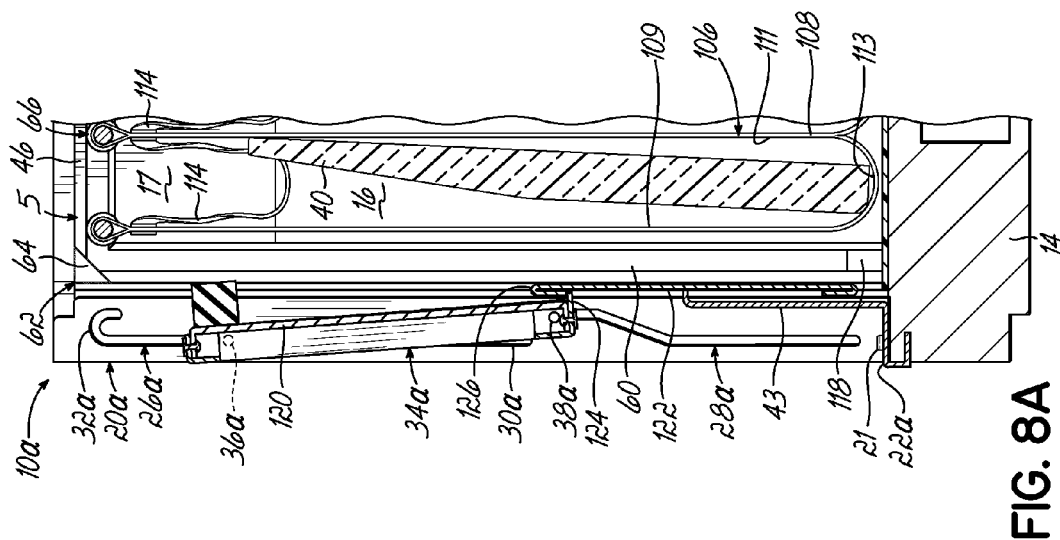


FIG. 8A

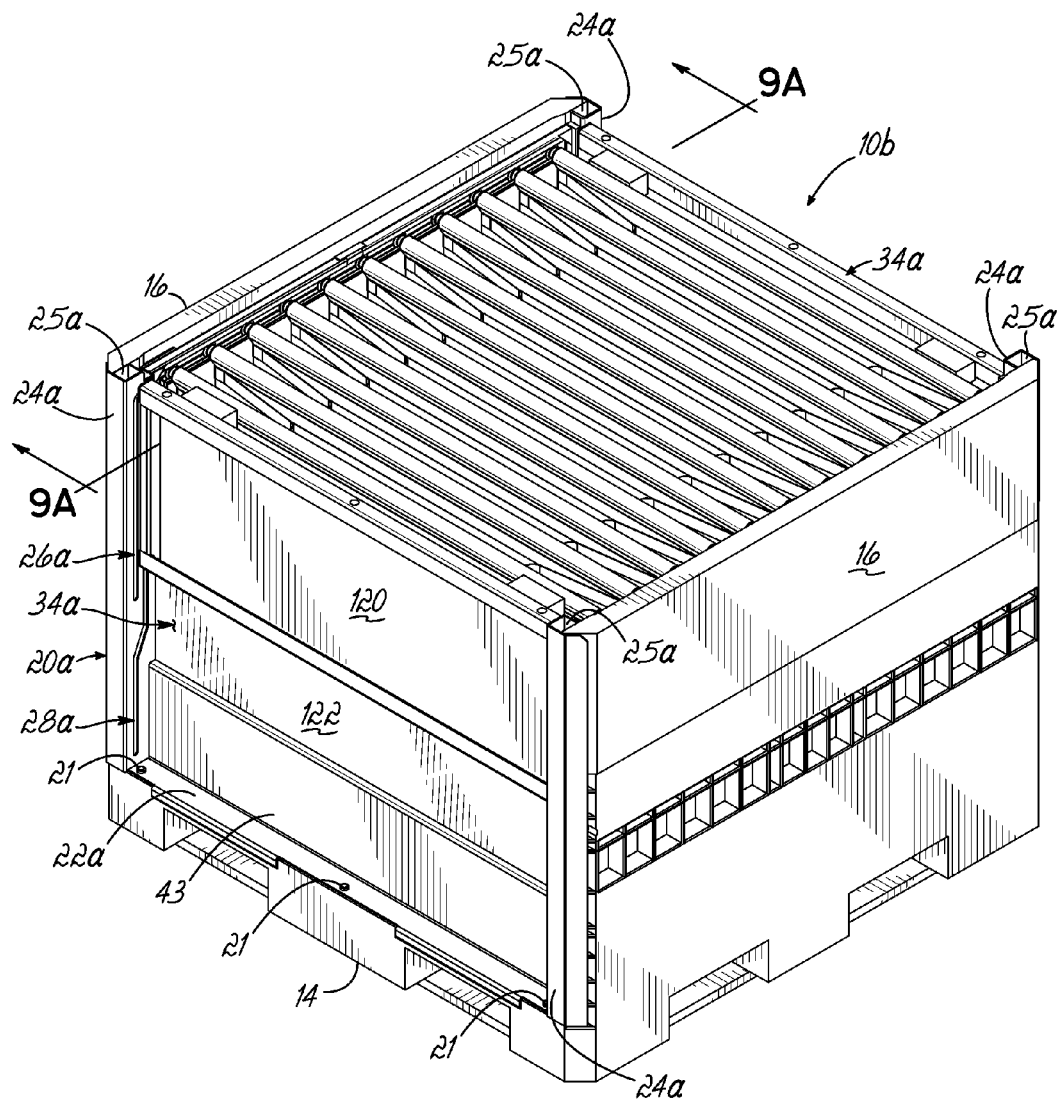


FIG. 9

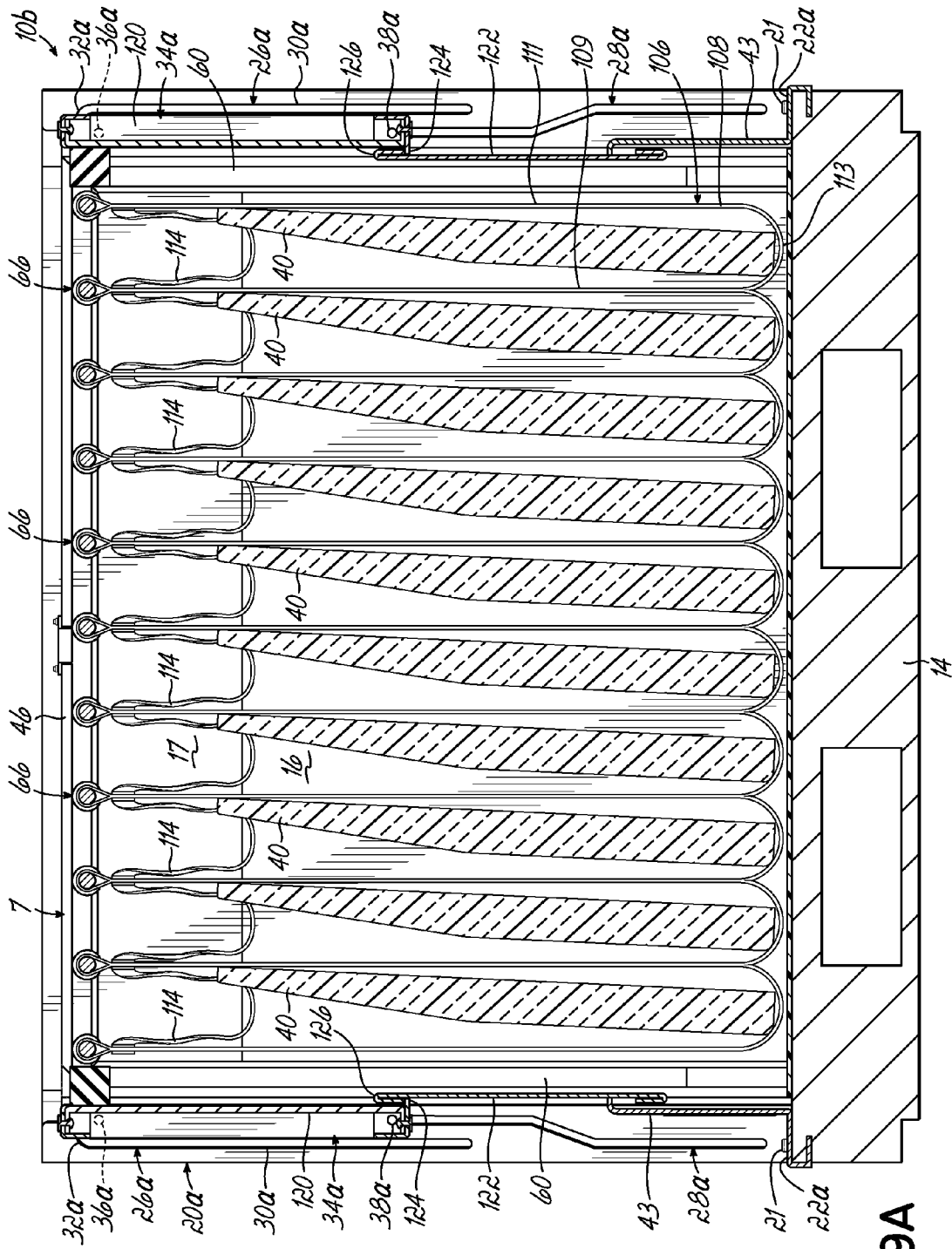
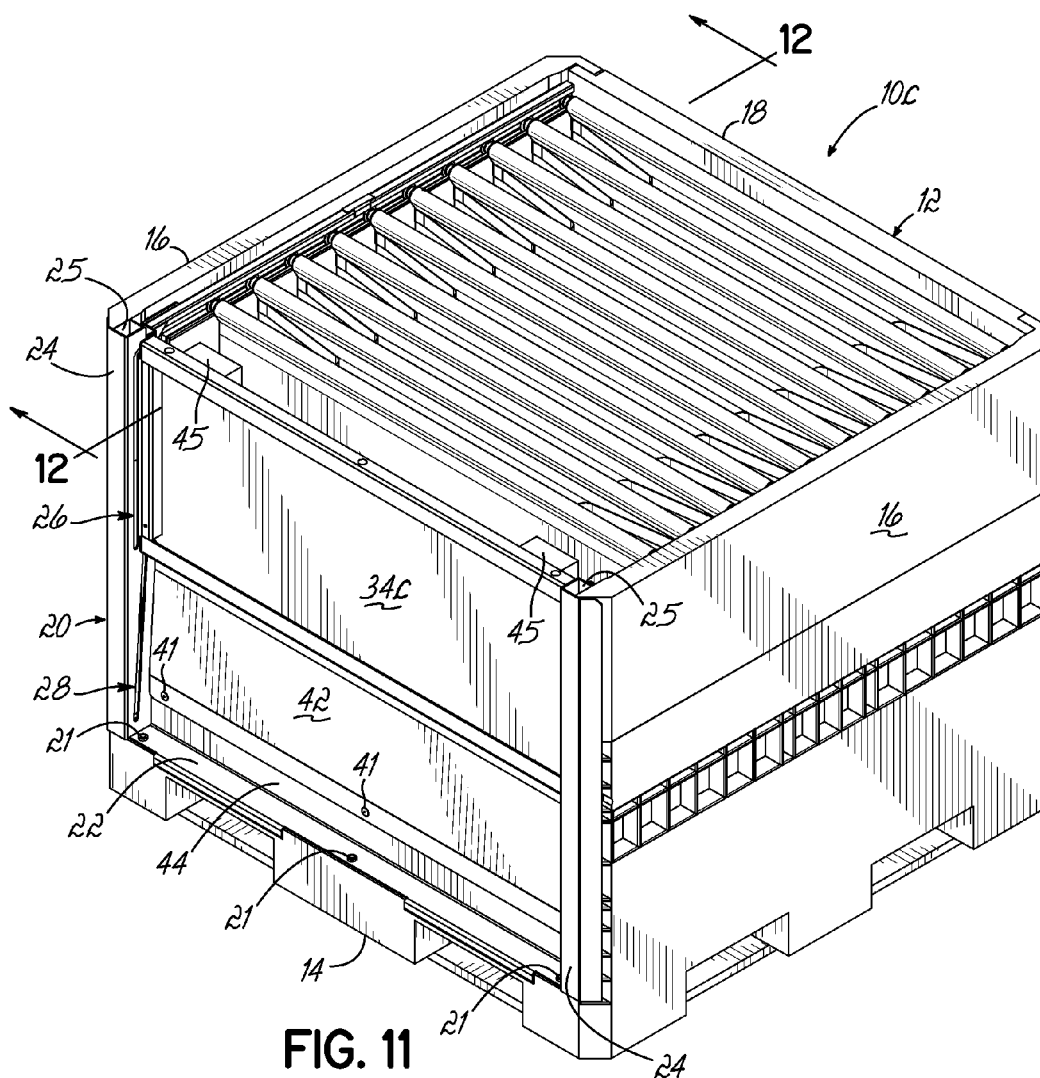
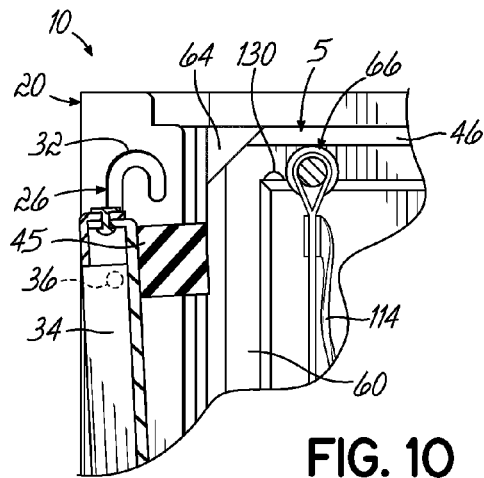


FIG. 9A



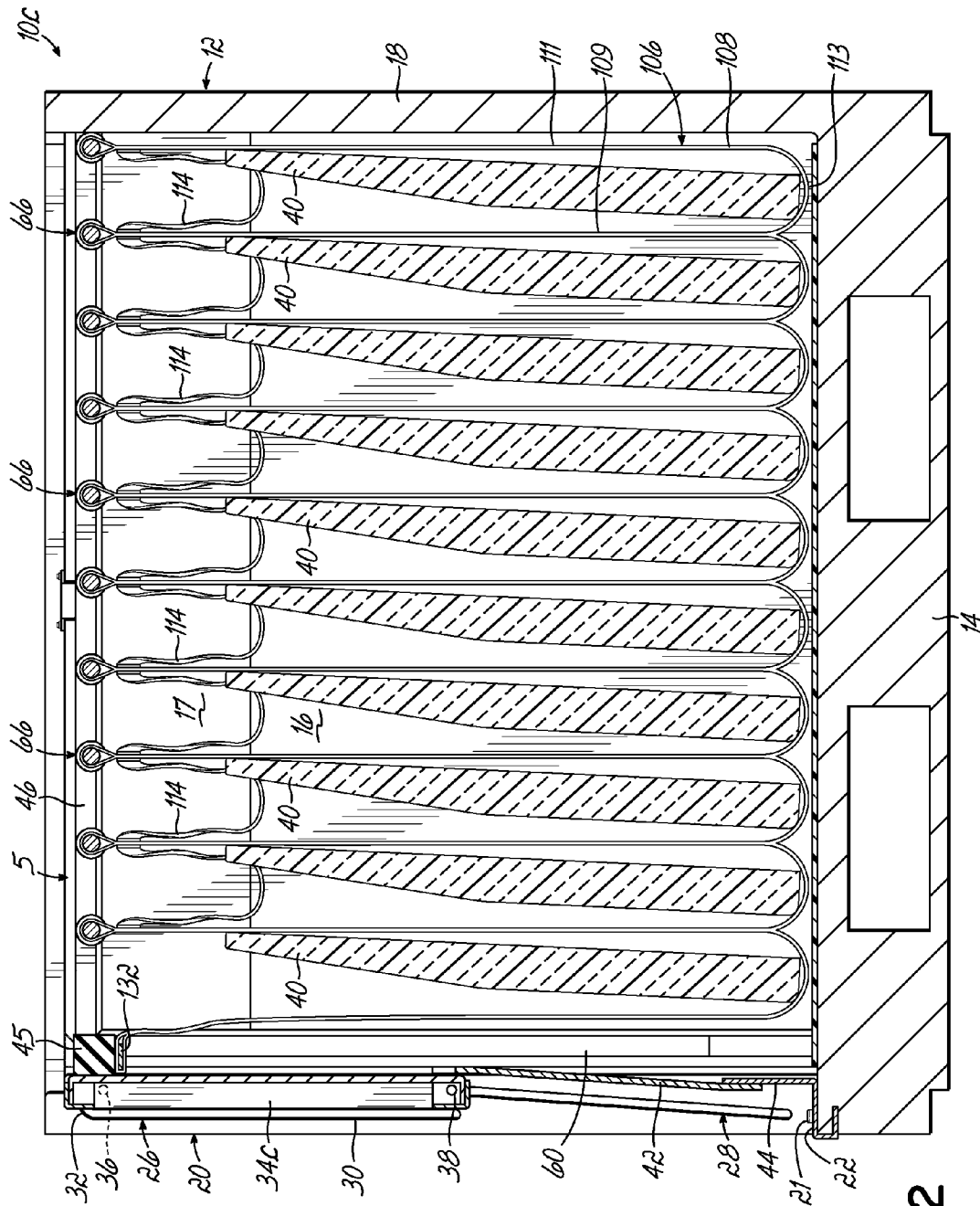


FIG. 12

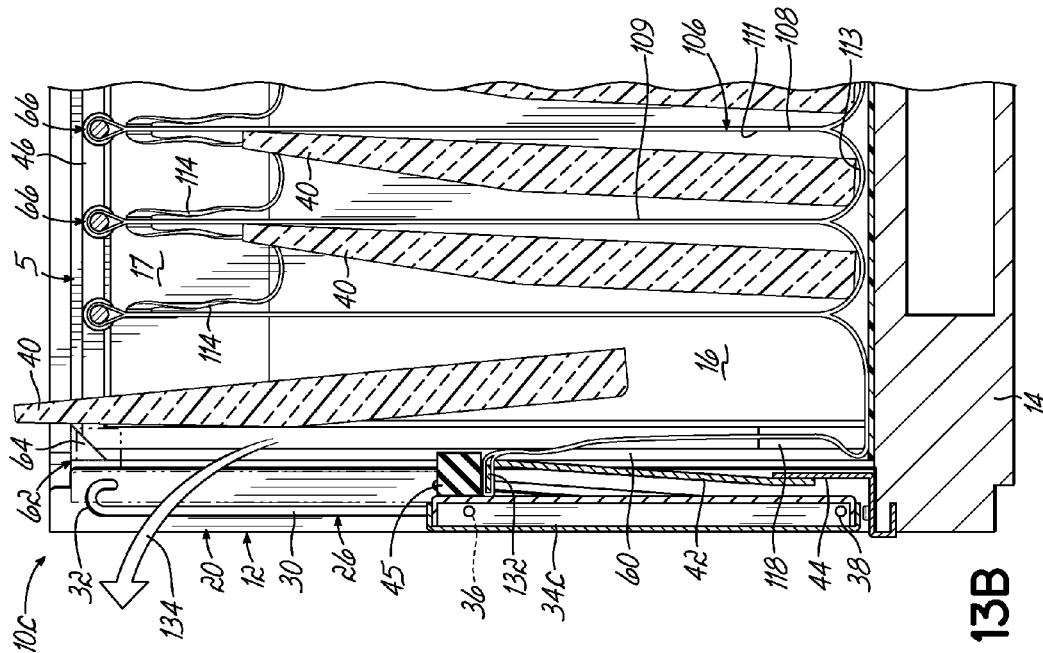


FIG. 13B

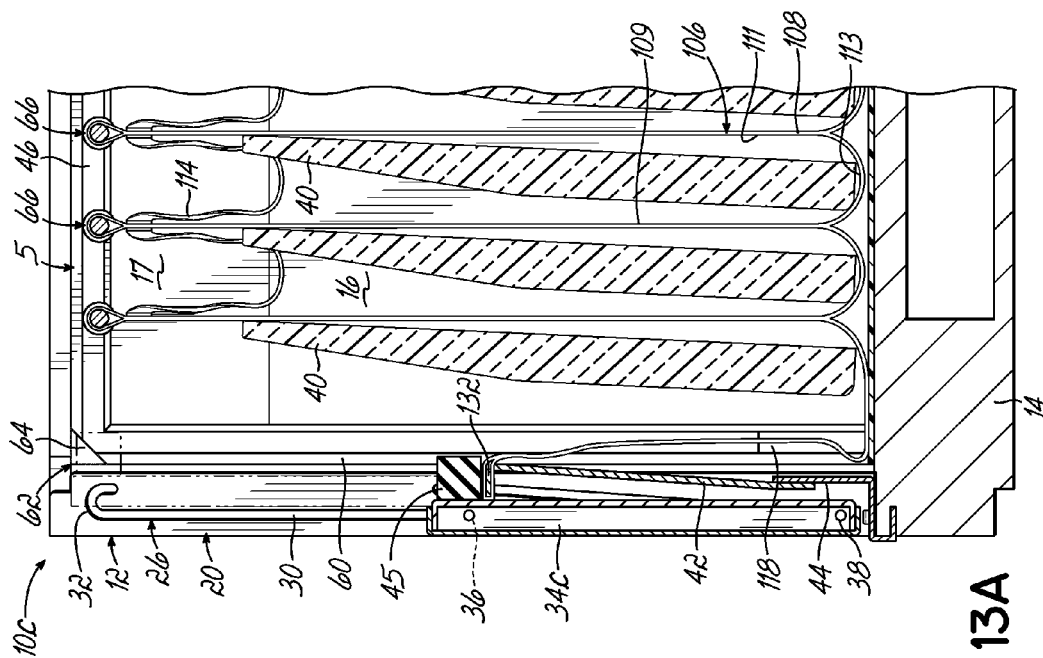


FIG. 13A

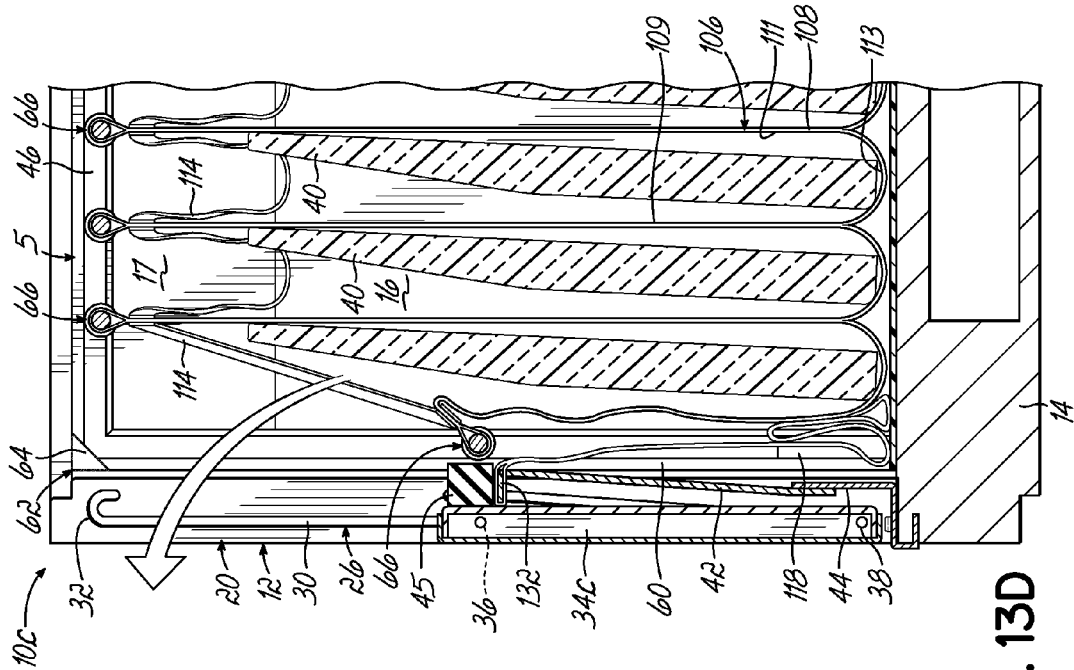


FIG. 13C

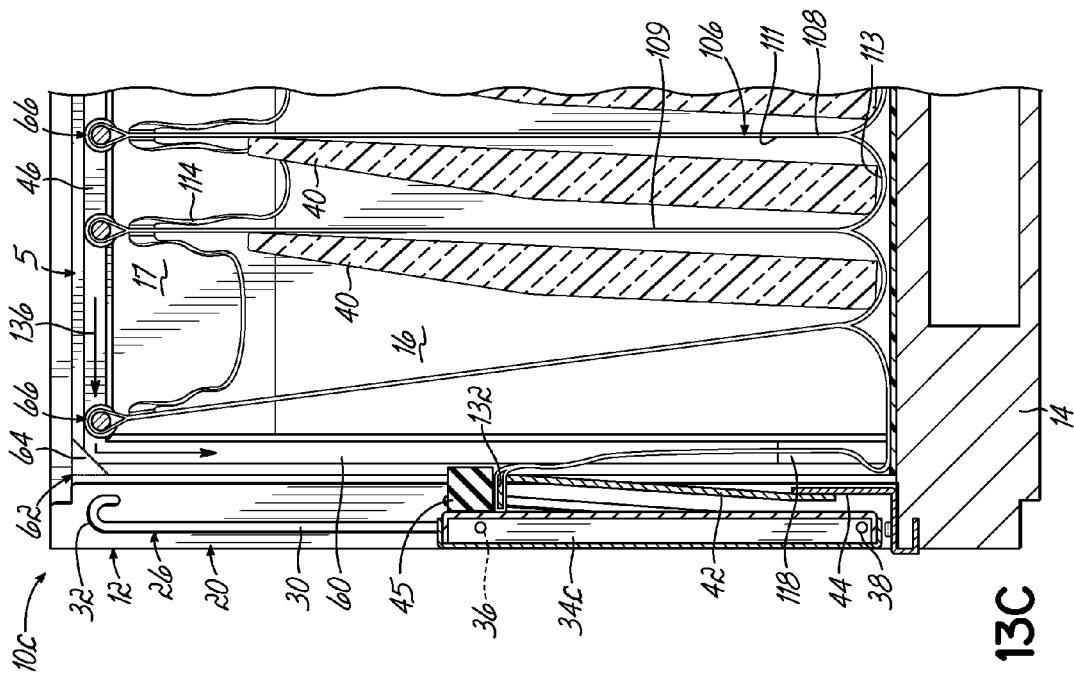


FIG. 13D

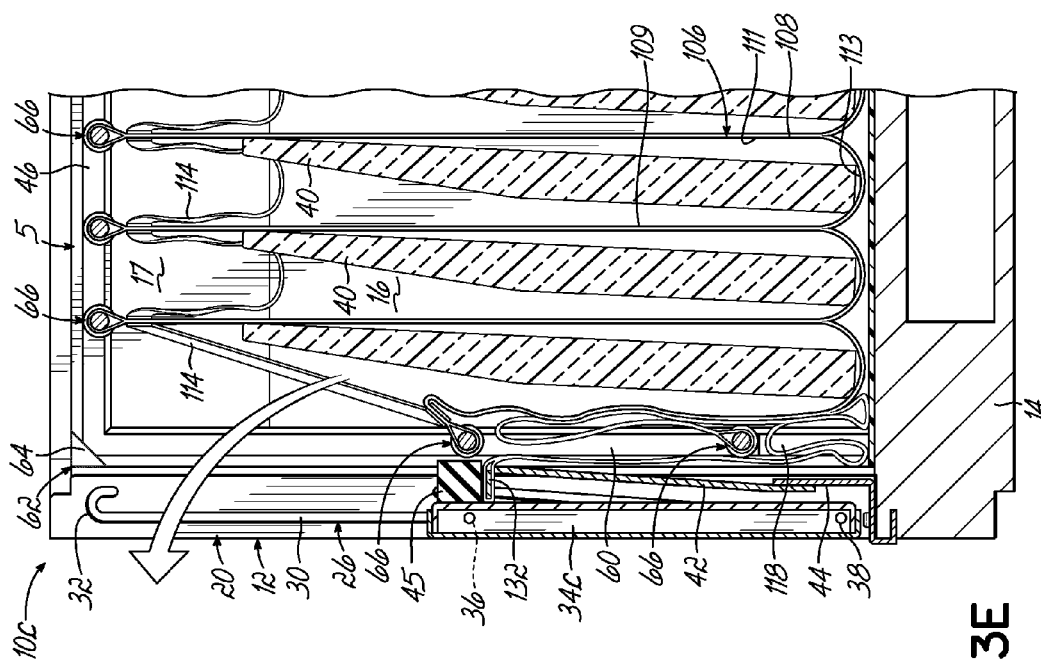


FIG. 13E

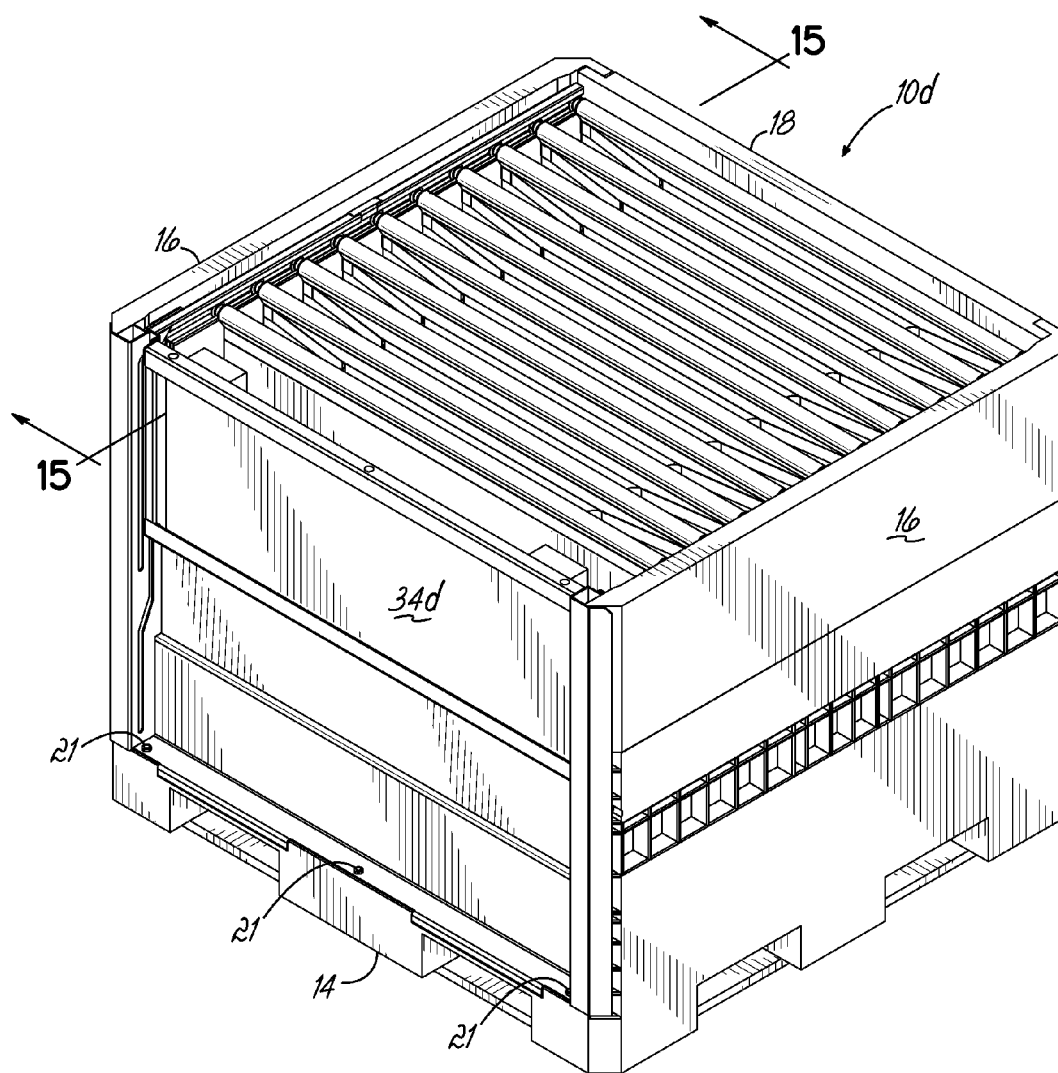


FIG. 14

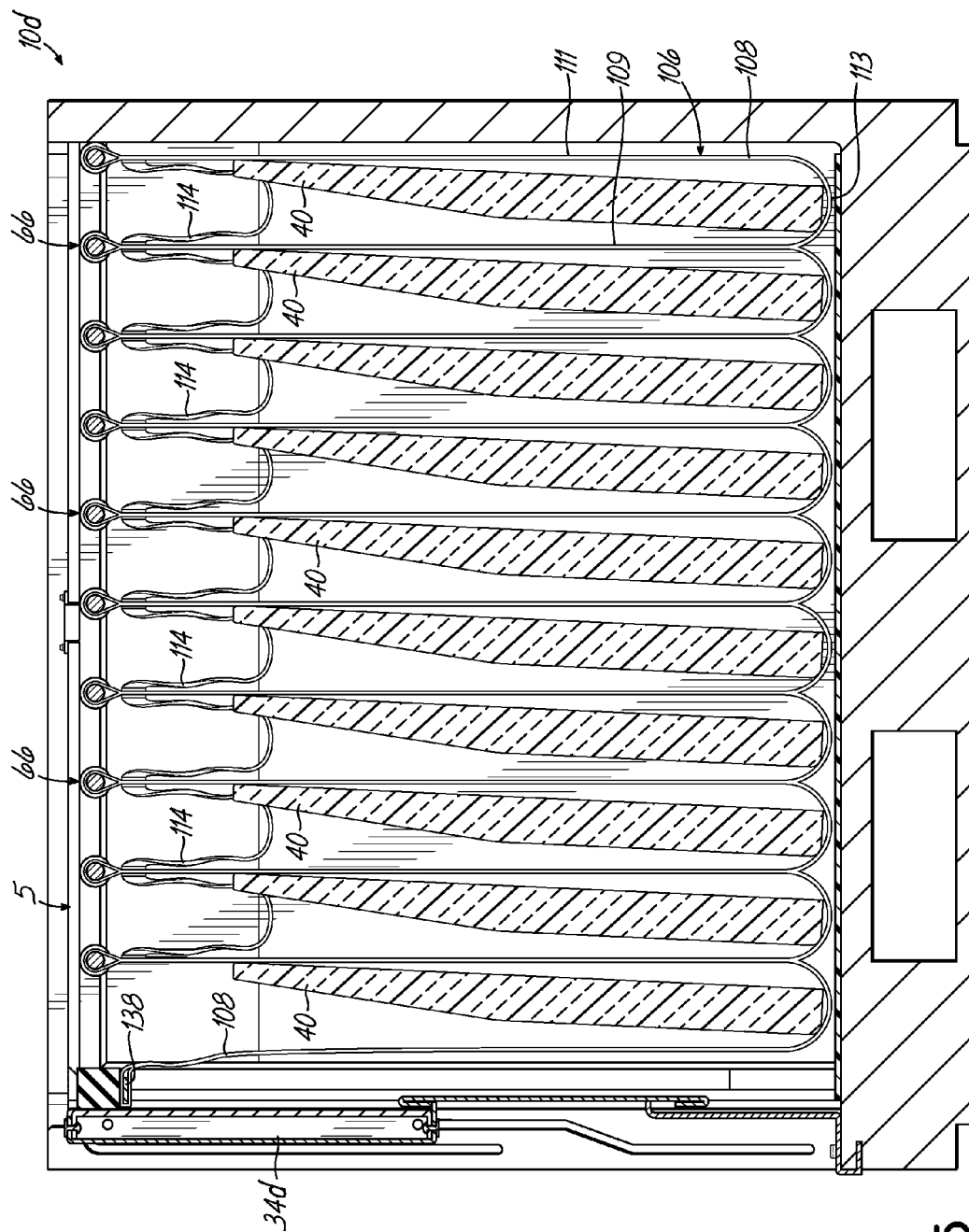


FIG. 15

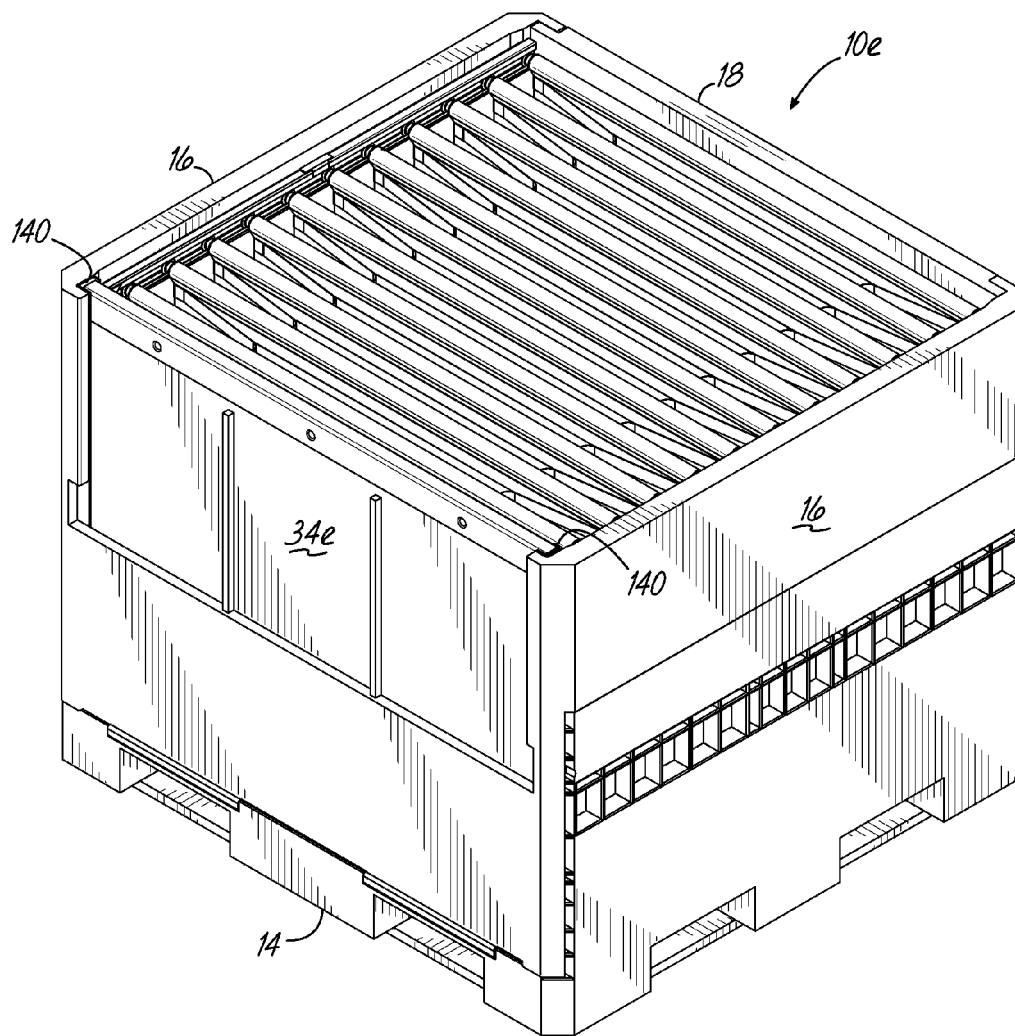


FIG. 16

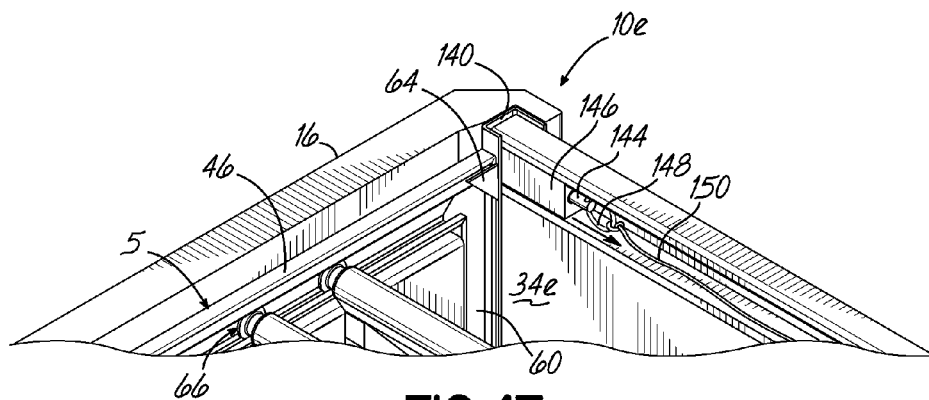


FIG. 17

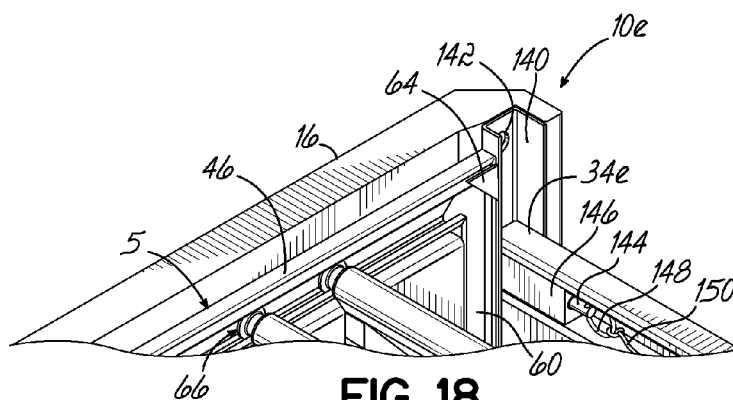


FIG. 18

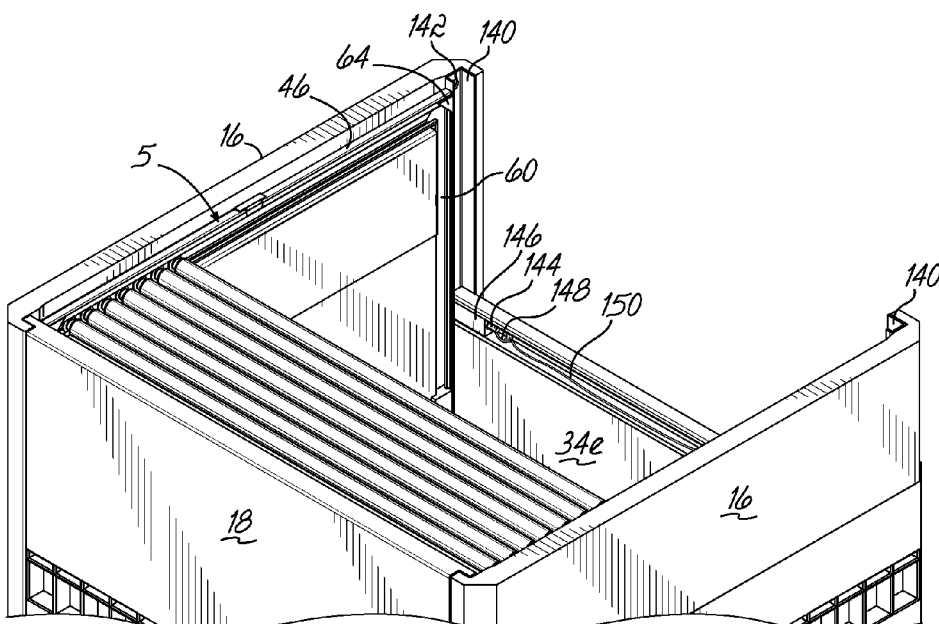


FIG. 19

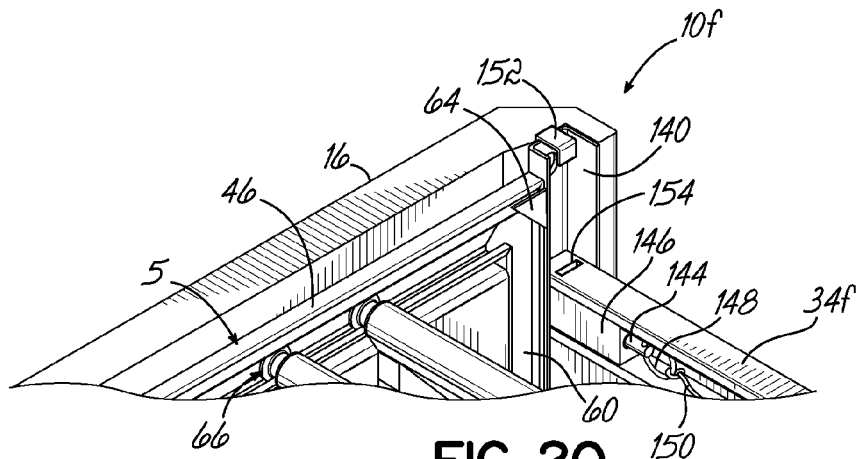


FIG. 20

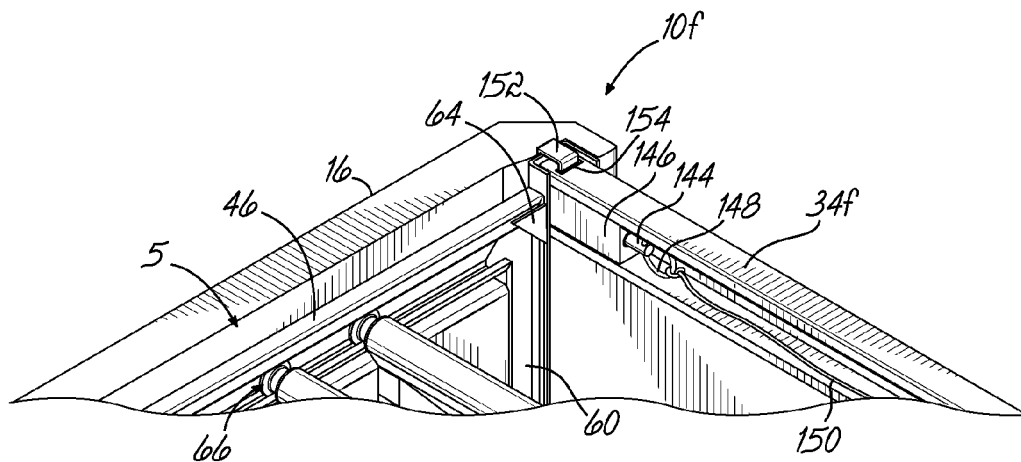


FIG. 21

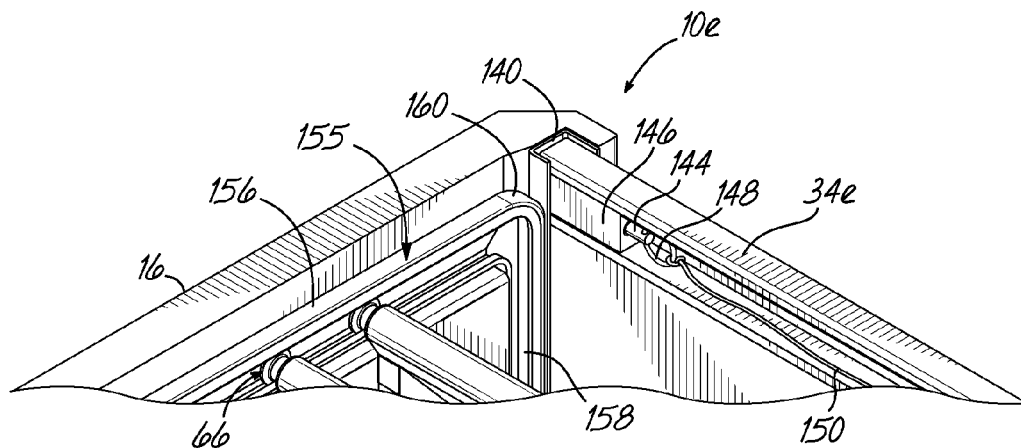


FIG. 22

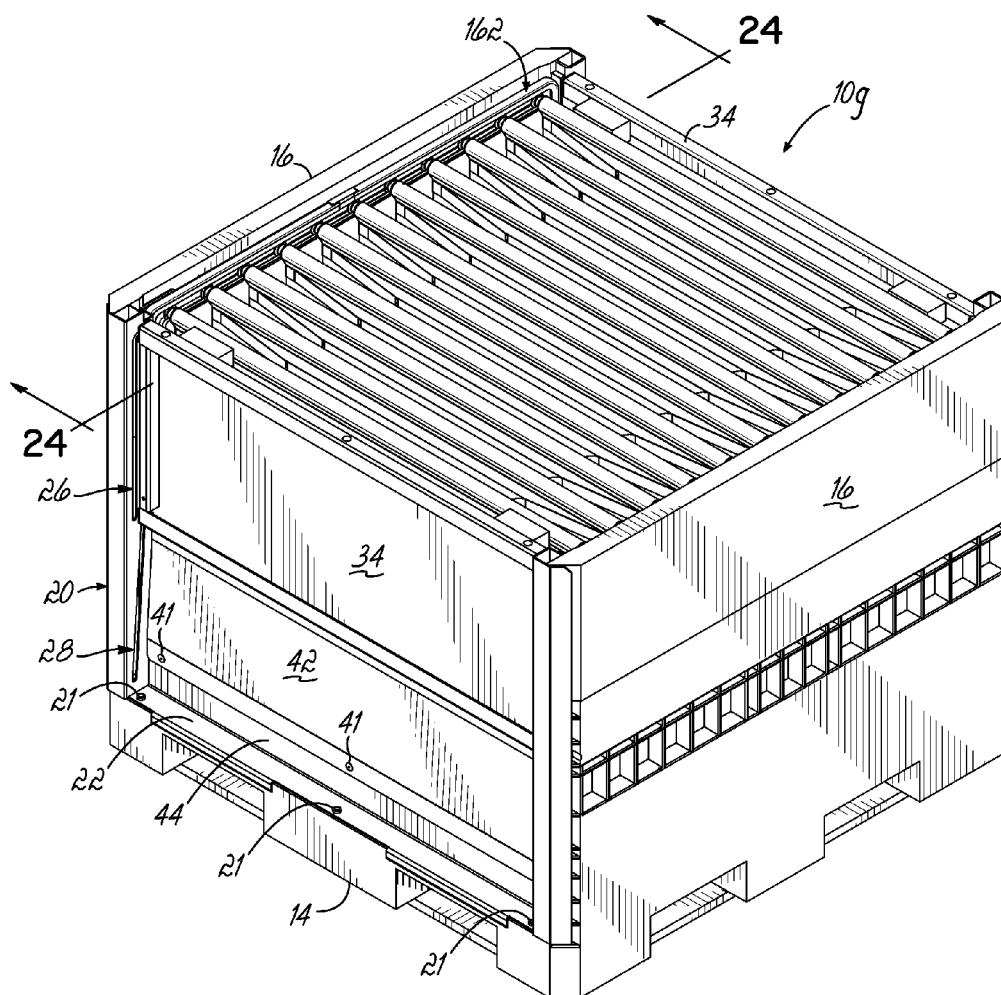


FIG. 23

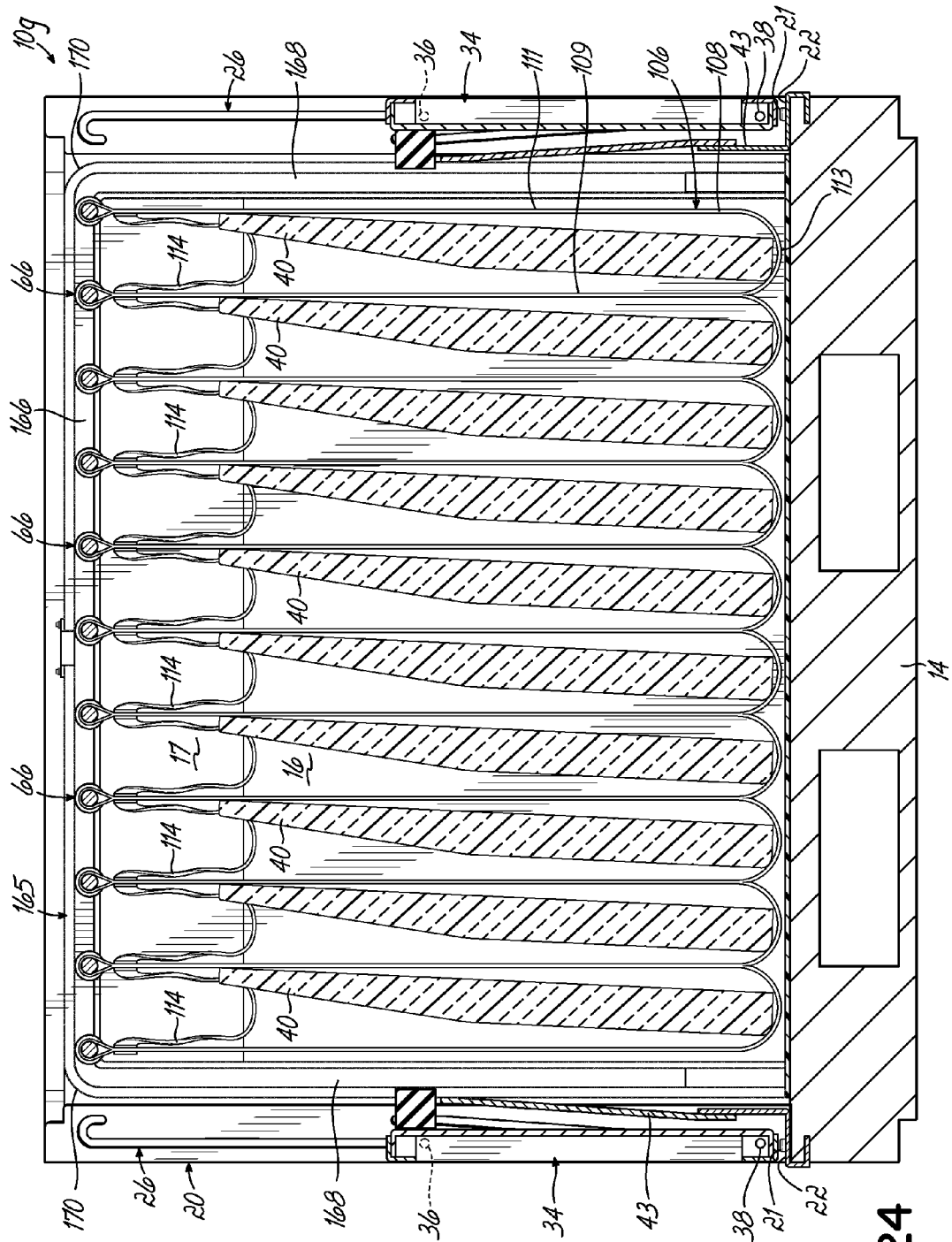


FIG. 24

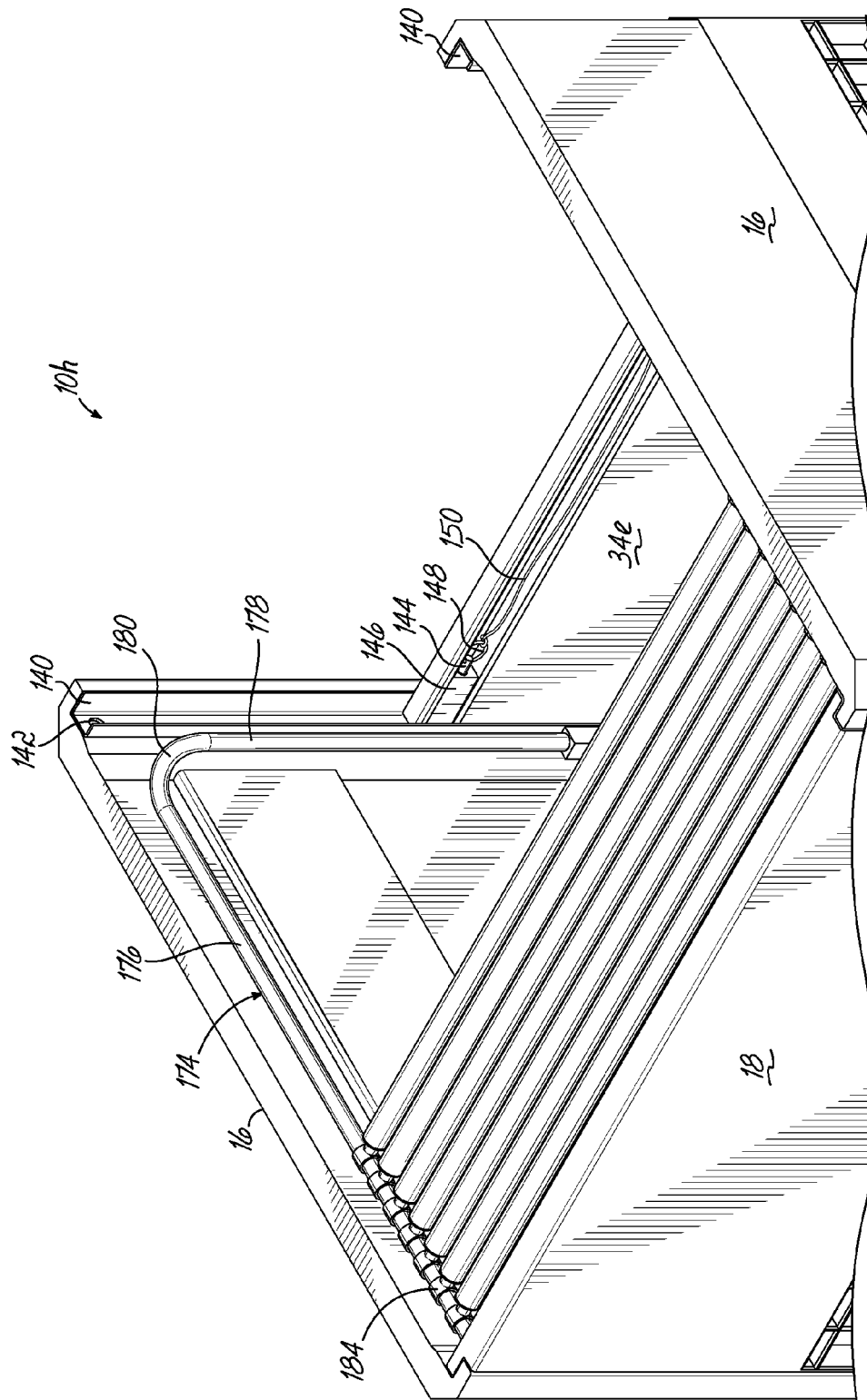
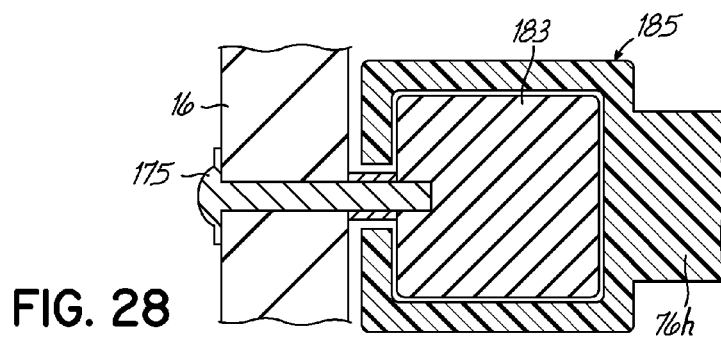
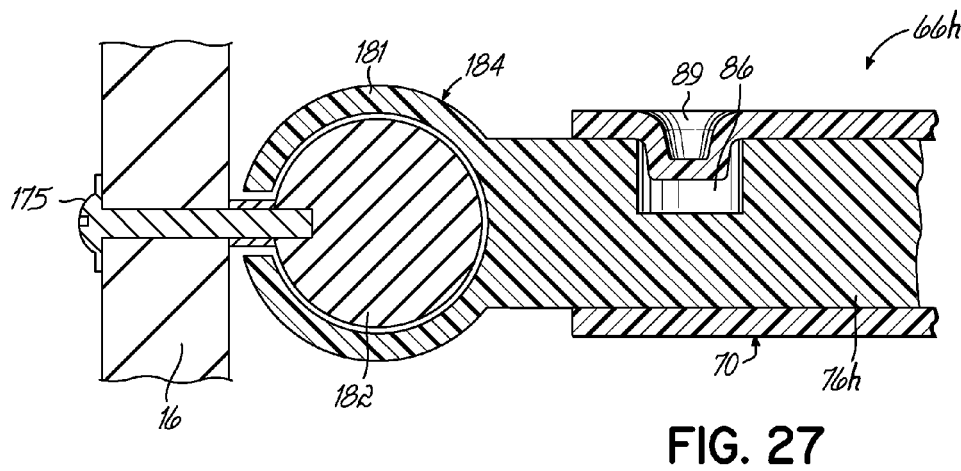
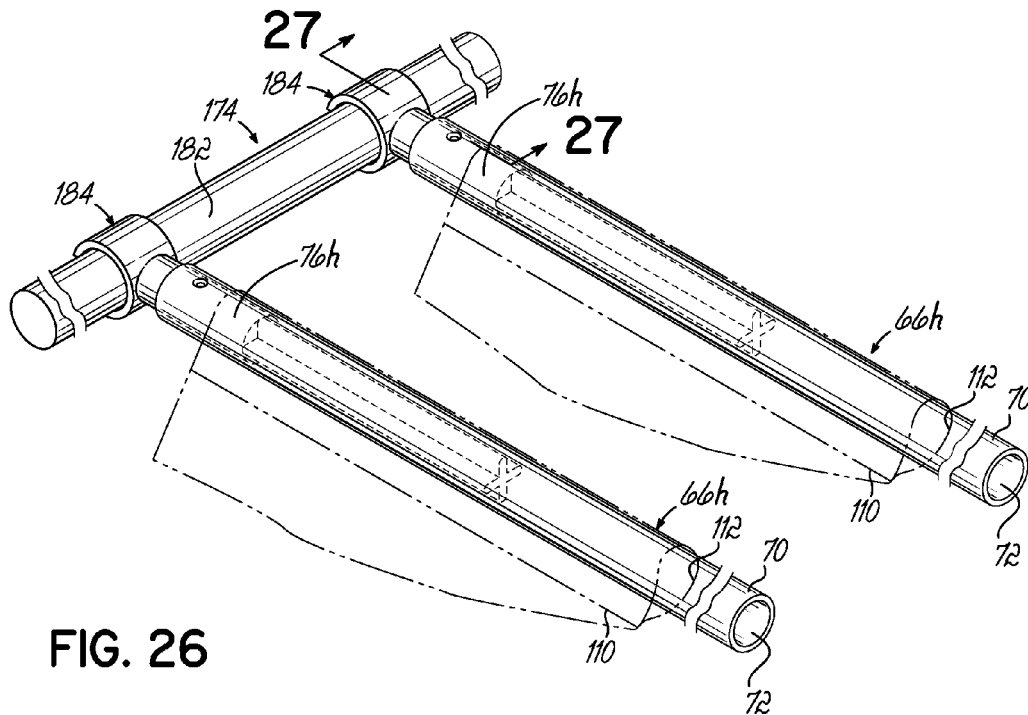


FIG. 25



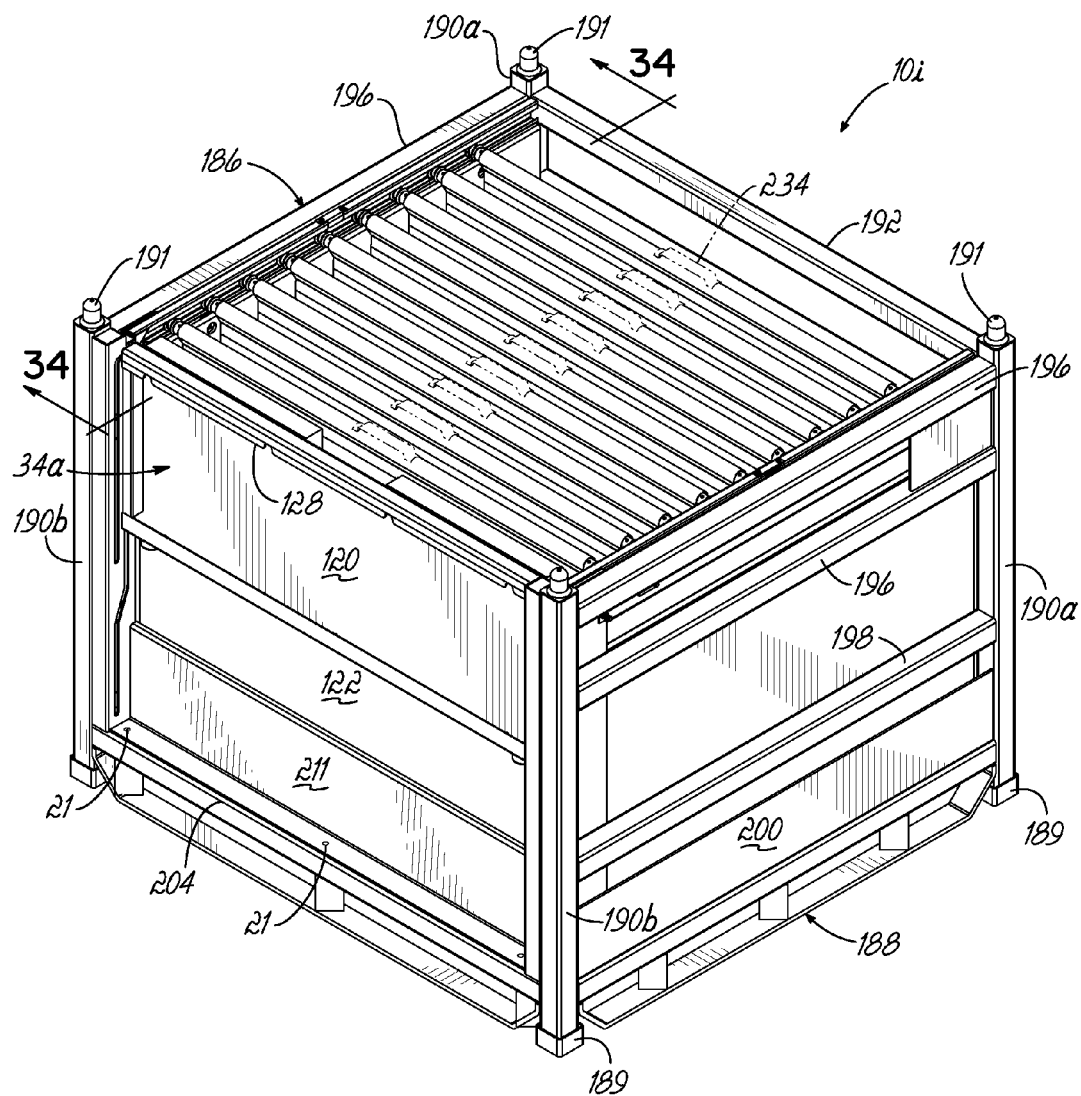


FIG. 29

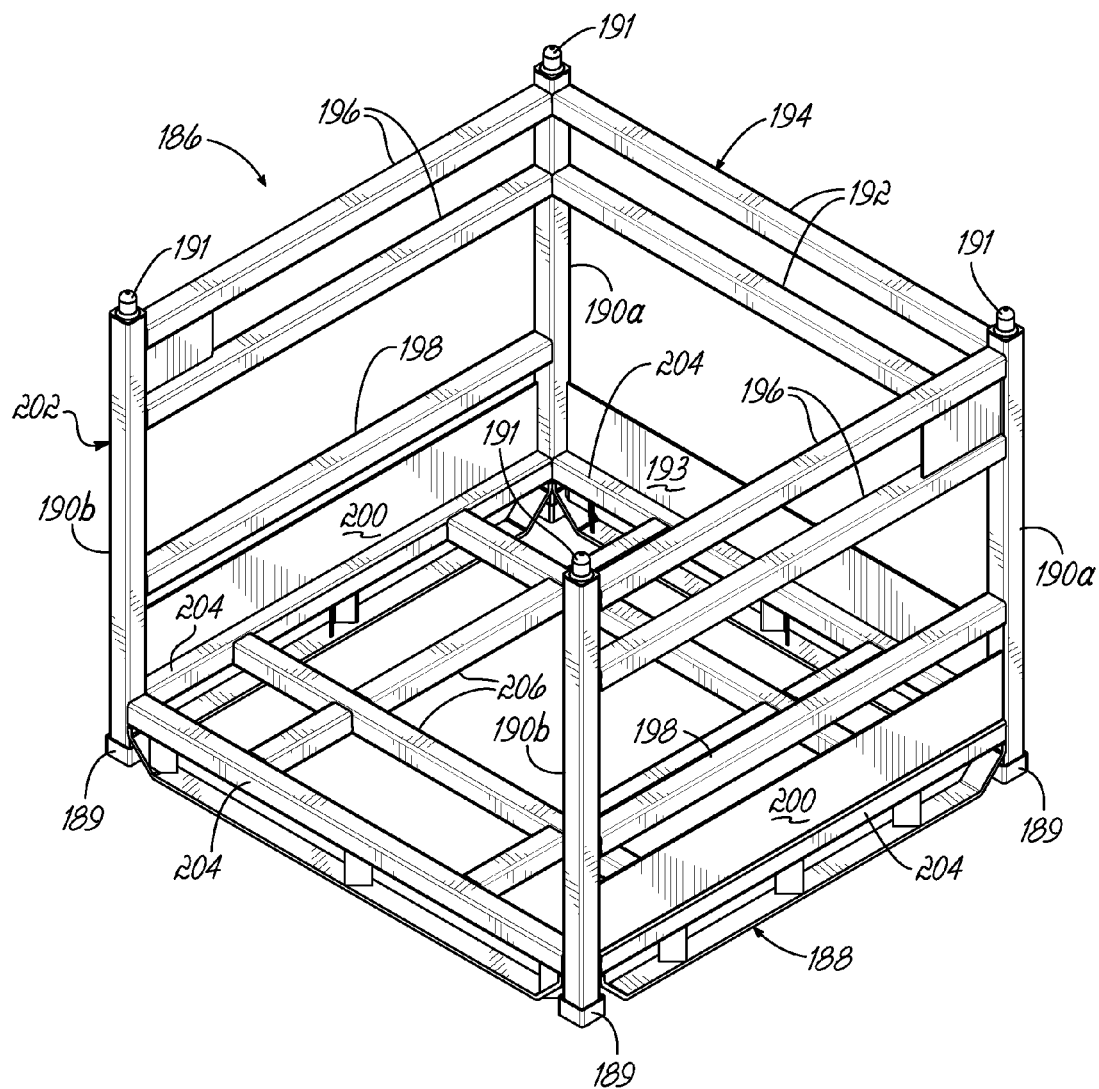


FIG. 30

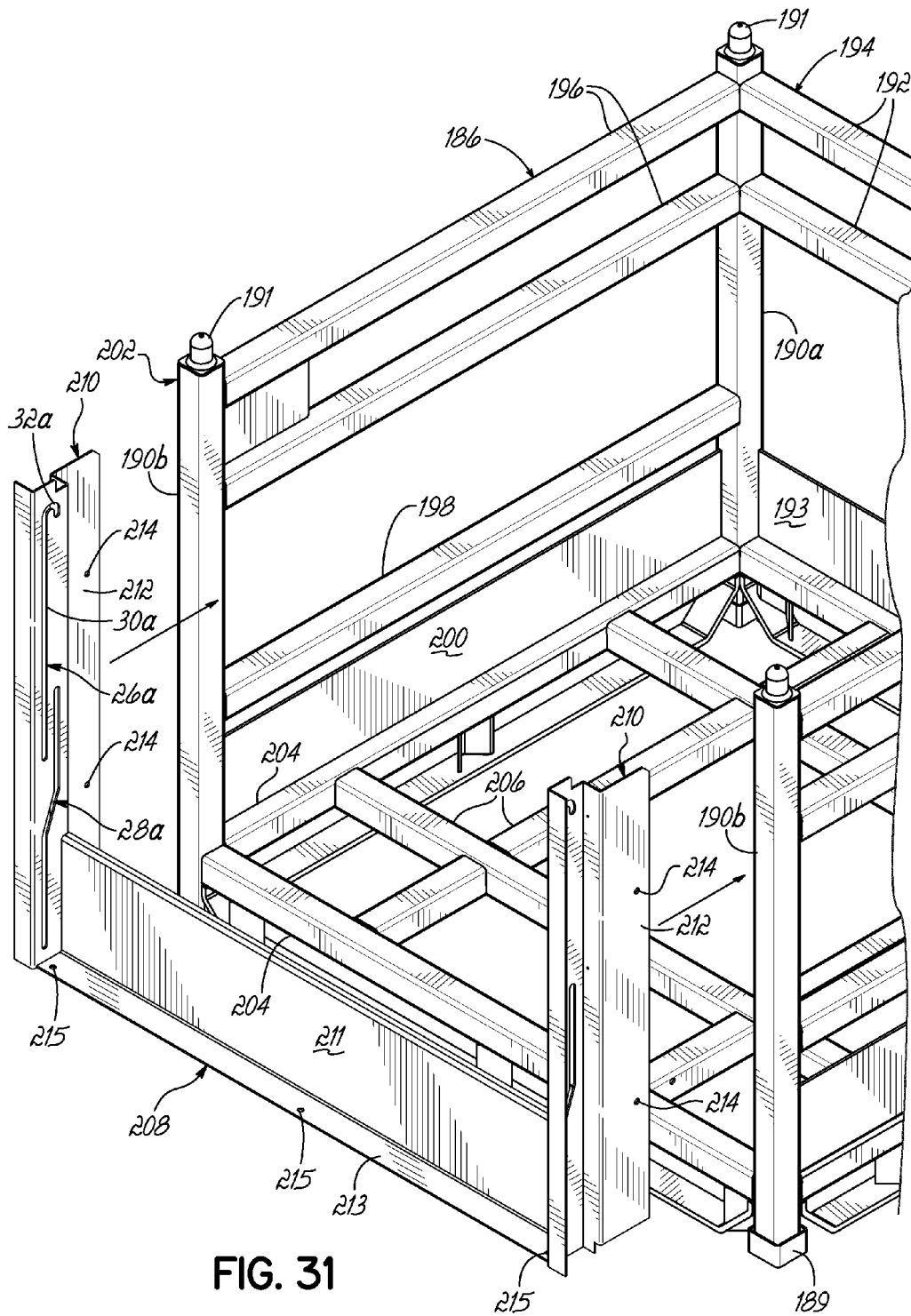


FIG. 31

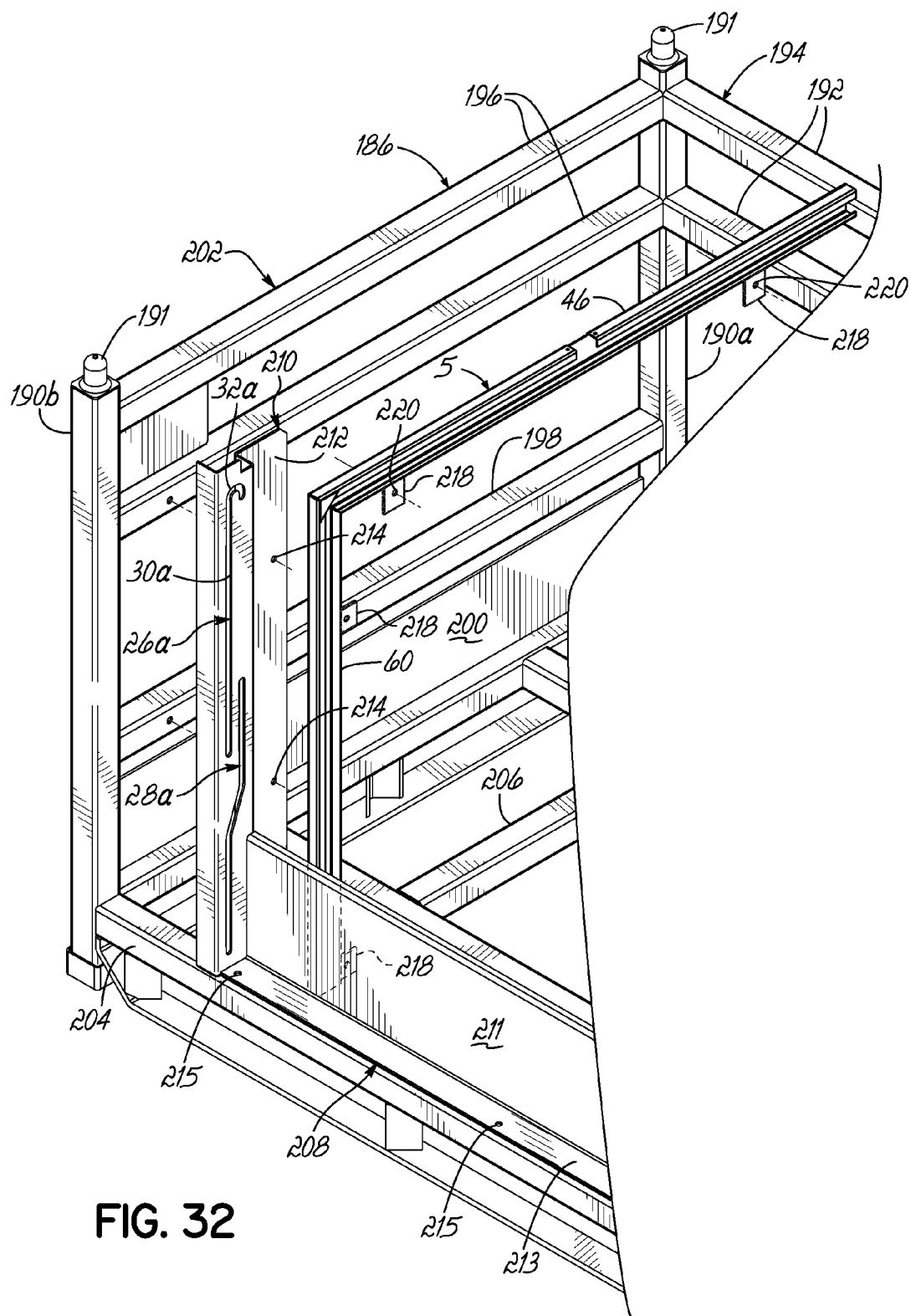


FIG. 32

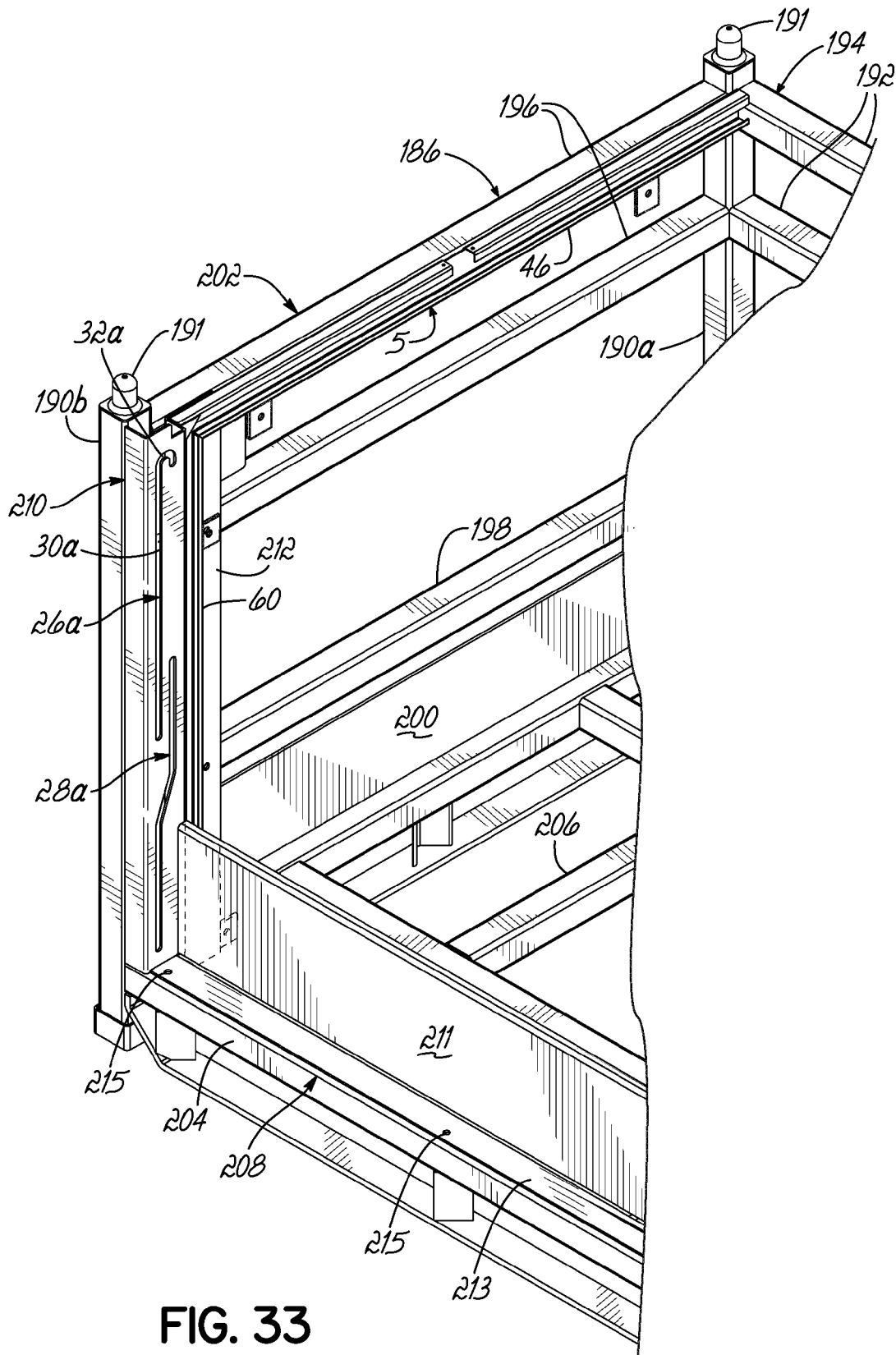


FIG. 33

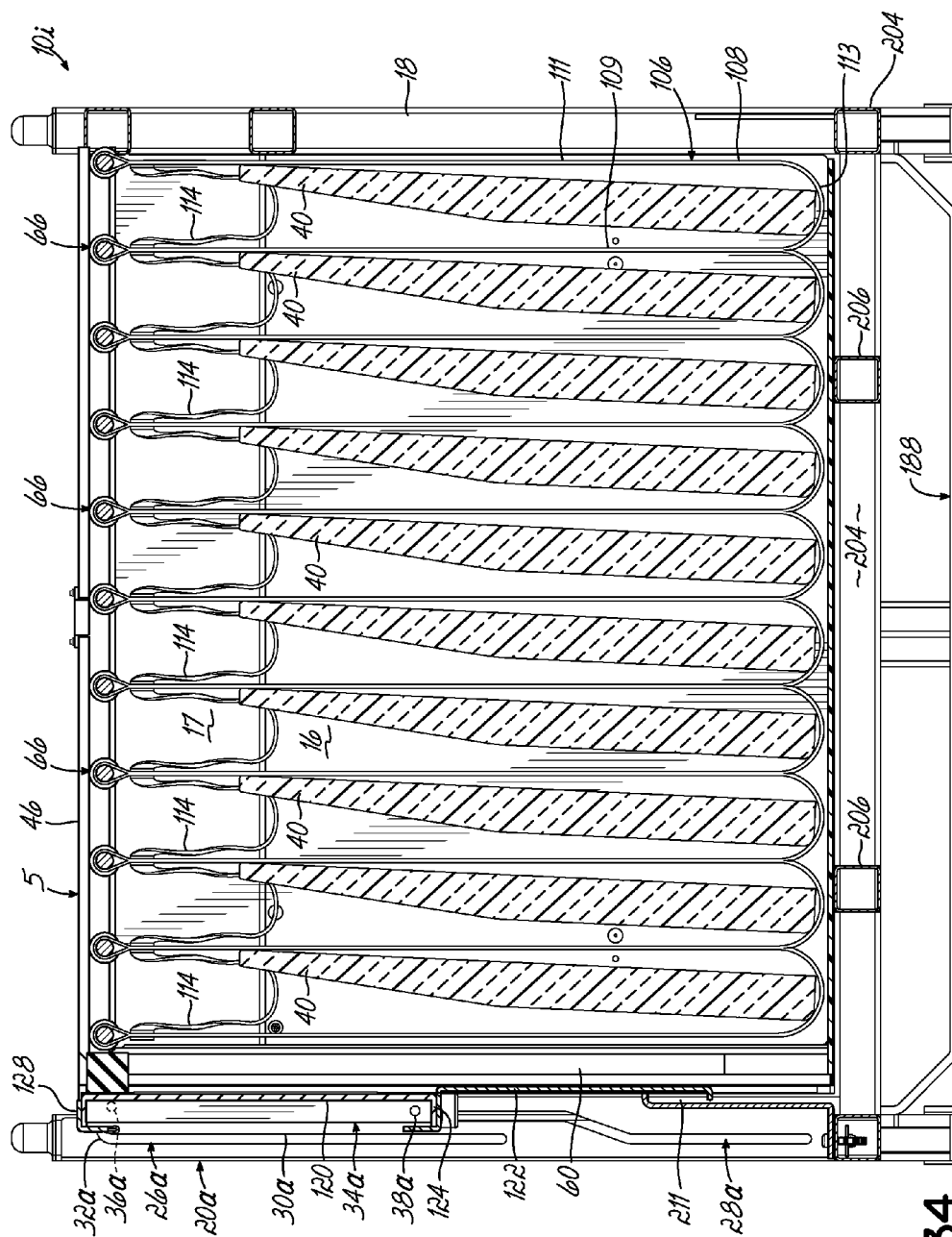


FIG. 34

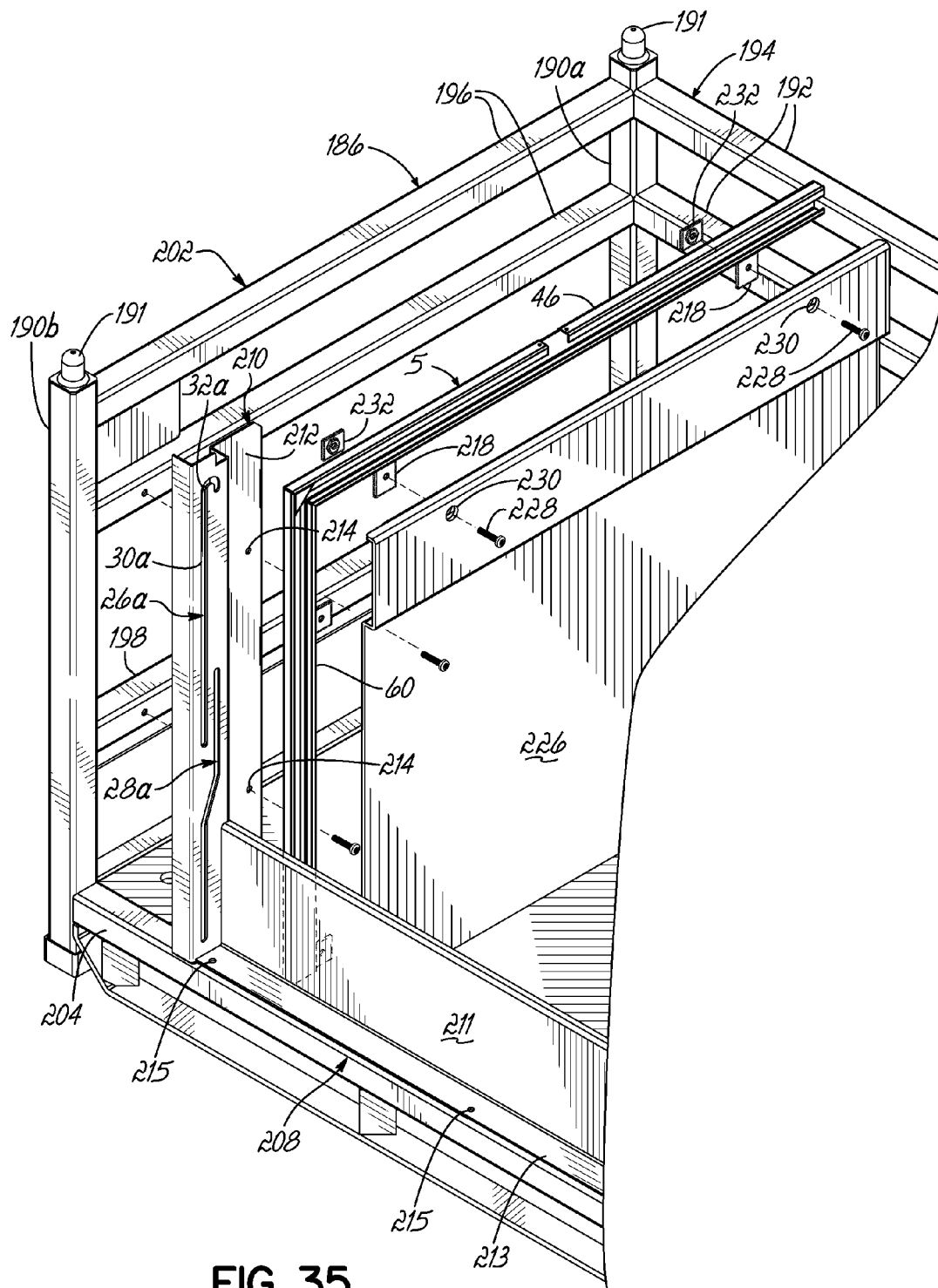


FIG. 35

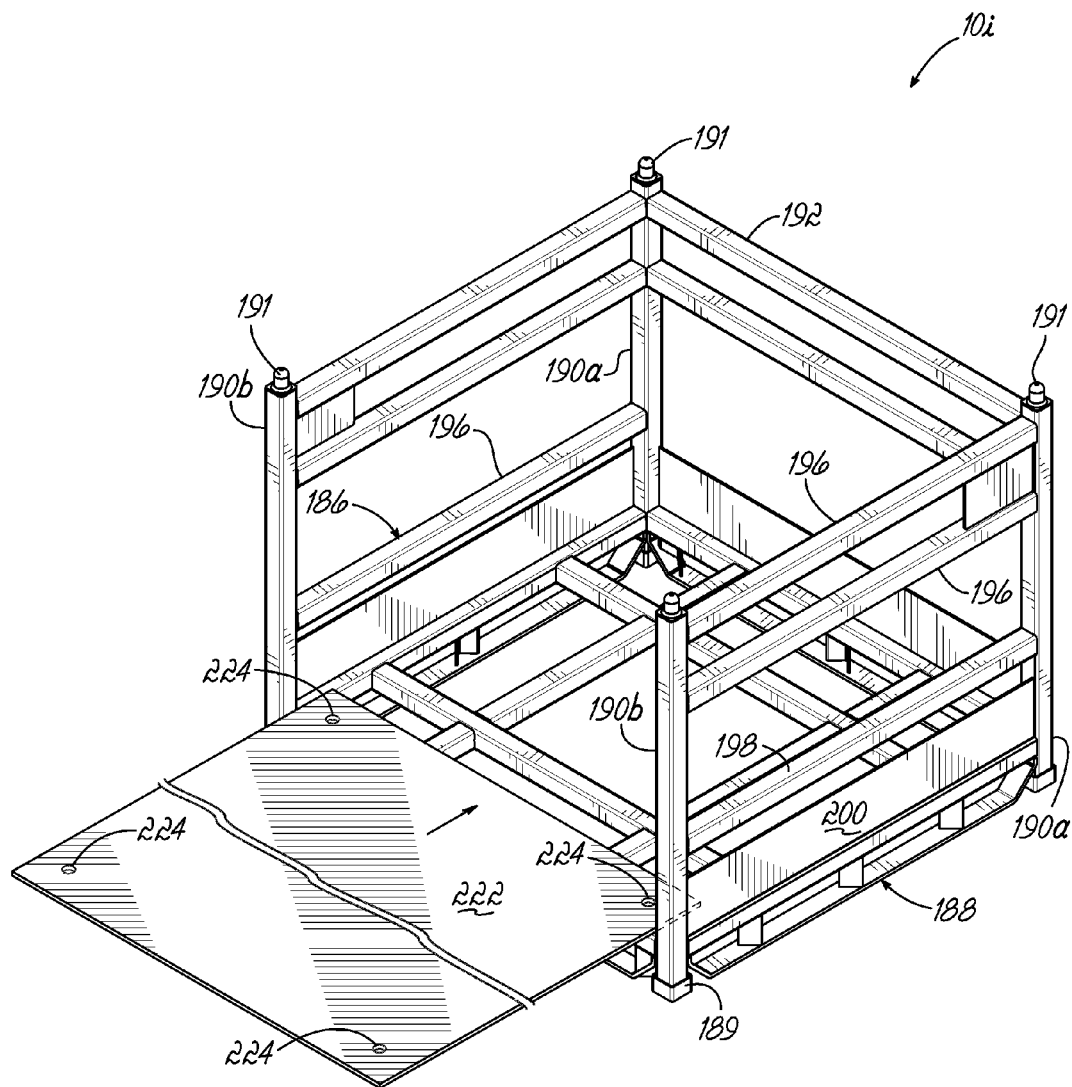


FIG. 36

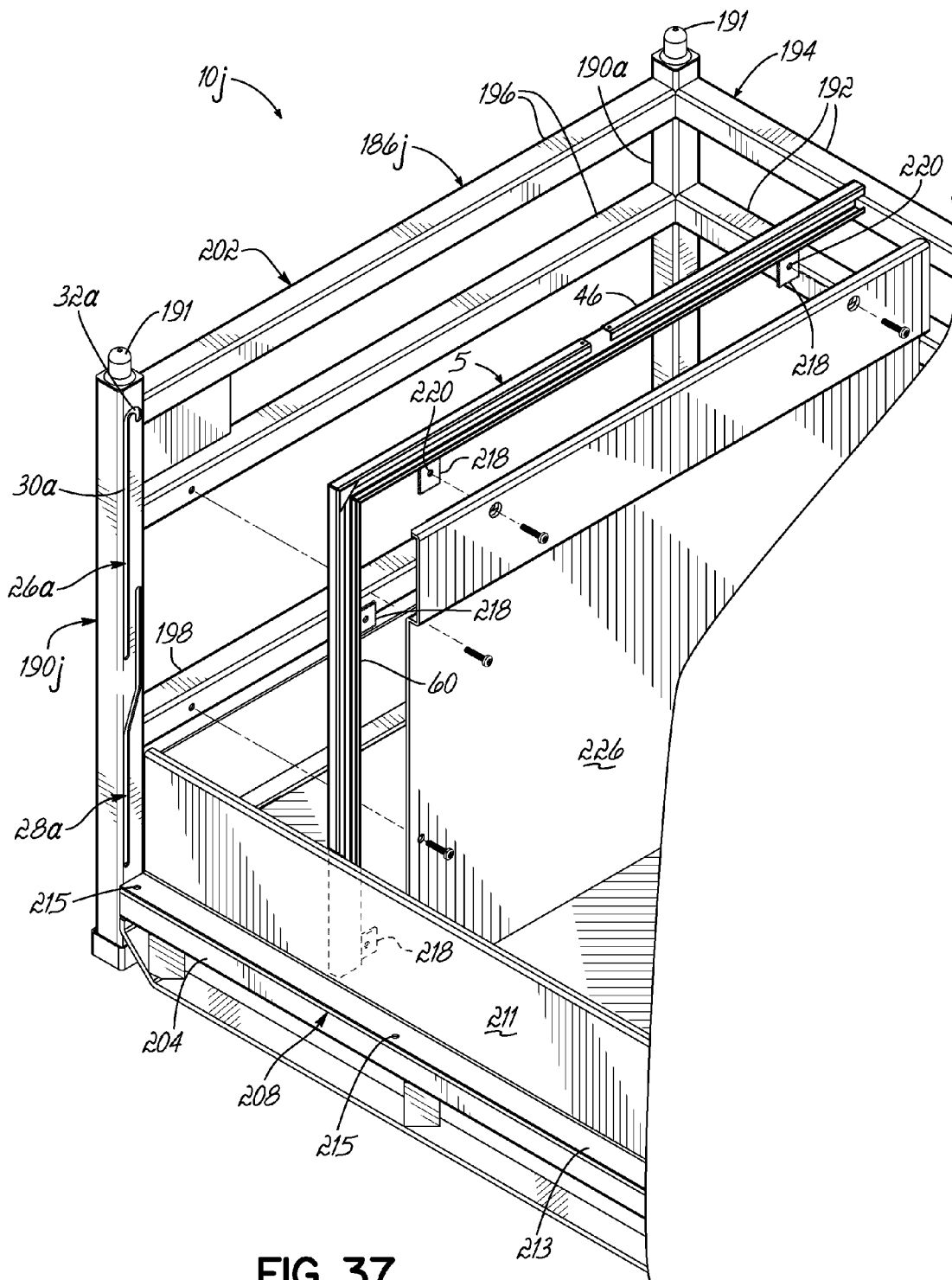


FIG. 37

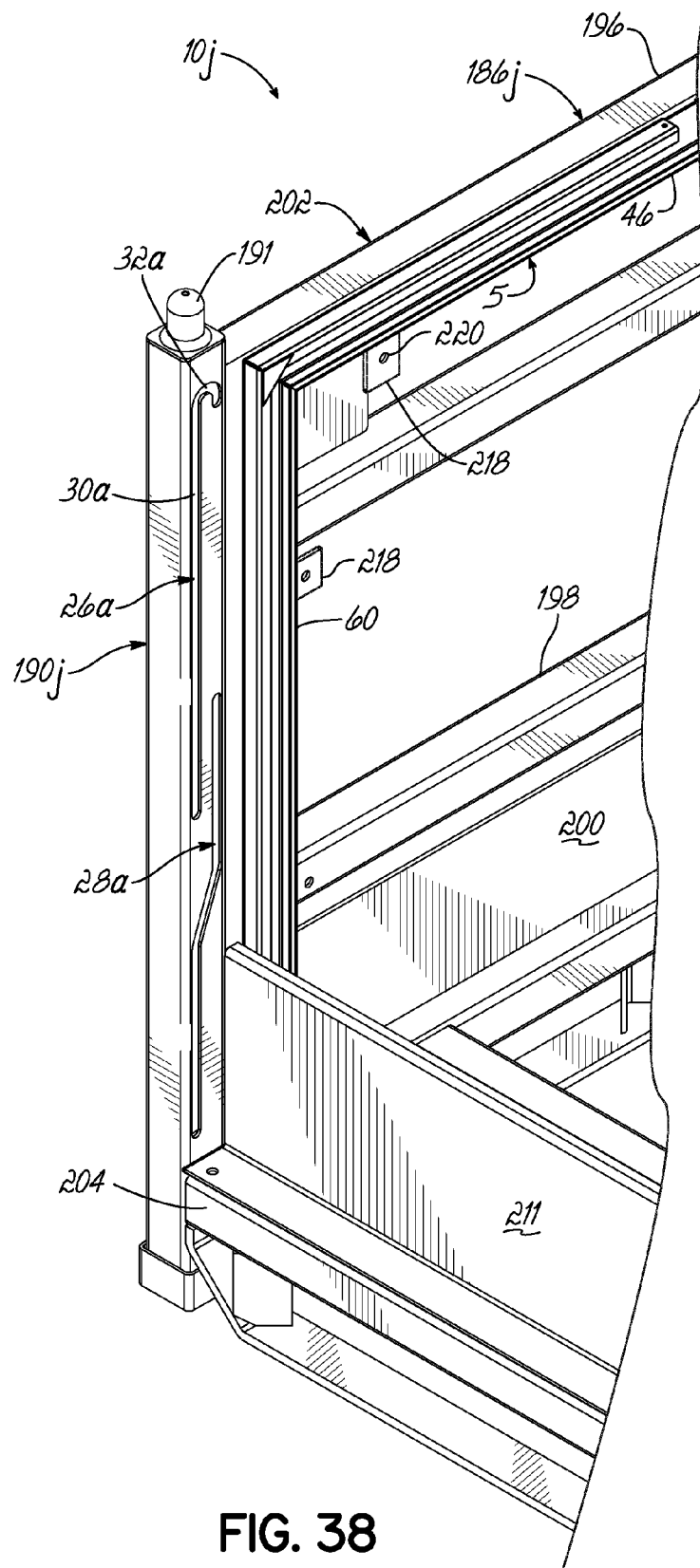


FIG. 38

1

CONTAINER HAVING METAL OUTER FRAME FOR SUPPORTING L-SHAPED TRACKS

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 13/616,635 filed Sep. 14, 2012, now U.S. Pat. No. 9,004,307, which is fully incorporated by reference herein.

FIELD OF THE INVENTION

The present invention relates to containers for use in shipping and, more particularly, to containers with movable members for supporting product.

BACKGROUND OF THE INVENTION

A large number of different container structures are utilized by manufacturers to ship a variety of different products to end users, which may be, for example, assembly plants. In the automobile industry, for example, an assembly plant assembling a particular automobile might utilize a number of different parts from different manufacturers. These manufacturers ship their respective parts to the assembly plant in container structures where the parts are then removed from dunnage or support members inside the container structure and assembled into a finished automobile.

Access to the product in the containers is of particular concern. Specifically, in the automotive industry, the containers full of product are positioned on an assembly line adjacent to a work area, which is associated with a particular product to be installed on a manufactured vehicle. For example, a container full of interior door panels is usually positioned next to a particular station on an assembly line where interior door panels are installed so that a line worker may easily access the door panels inside the container. The product or part is taken directly from the container and used on the line. Some existing containers are difficult to access, which makes removal of the parts therein difficult and time consuming. For example, some containers are configured so that a line worker must walk around the container to remove parts or products from opposite ends of the container. As may be appreciated, a line worker only has a certain amount of time to install a part. Any delay in access and removal of the part from the container is undesirable.

In many containers, a line worker or employee must insert or remove parts from a distal or rear part of the container. The size and/or weight of the parts or work pieces may cause stress or strain on the line worker and, more particularly, on the back of the worker when inserting or removing parts from such a container. Such ergonomically unfriendly movements may cause physical trauma, pain and other injuries that may lead to lost production time.

In some situations, in order to alleviate such stress and/or strain on his or her body, the line worker may move to the rear or opposite end of the container to remove parts from inside the container. This requires space around the container which may not be available, depending on the physical layout of the plant or facility. The length (front to back) of certain containers may be limited because the container manufacturer needs to eliminate the need for a line worker to walk around the container to remove product from inside the container. Such containers having a reduced length reduce the number of parts or products which may be shipped and/or stored in the con-

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tainer. The more containers needed to ship a predetermined number of parts, the greater the cost to the shipper.

In other containers, a line worker or employee must lean forward and bend down into the container to insert or remove a part or work piece from a lower portion of the container. This movement by the line worker is ergonomically unfriendly because the line worker must lean forward and bend down and lift a part or workpiece up and over a wall into the container to remove the part or work piece from inside the container. Similarly, when a part or workpiece must be inserted into a container, the line worker may have to lean forward and insert the part, which may be heavy, into its proper location inside the container, again experiencing ergonomically unfriendly movements. Such movements may be necessary with many top loading containers and/or containers having multiple layers or levels of parts.

Depending upon the number of times the line worker repeats this unnatural motion into the interior of the container, strain in the back, legs and arms may result. The size and/or weight of the parts or work pieces may increase the strain on the line worker. Thus, simply removing multiple parts during a work day may cause physical trauma, pain and other injuries that may lead to lost production time.

Accordingly, there is a need for a container which prevents employees from walking around the container to insert or remove product from inside the container.

There is further a need for a container which prevents employees from having to perform difficult or straining repetitive reaching motions.

There is further a need for a container which brings product into an ergonomically friendly area or zone for insertion or removal of the product.

SUMMARY OF THE INVENTION

The present invention provides a container for holding product therein during shipment that comprises a metal frame having a bottom and two sides. In one embodiment, a generally L-shaped stationary track is secured to each side of the metal frame. Each of the generally L-shaped stationary tracks has a substantially horizontally oriented portion and a substantially vertically oriented portion when the container is resting on the floor. The substantially horizontally oriented portion of each track is located proximate the open top of the container, and the substantially vertically oriented portion is located proximate the front of the container where a door may be located.

The container further comprises a plurality of movable slider assemblies or support member assemblies that are supported by the stationary tracks. For purposes of the present invention, the terms "slider assembly" and "support member assembly" may be used interchangeably; either may include multiple components secured together. For example, a "slider assembly" may comprise in combination a tubular support and a pair of end members which move or slide inside stationary tracks, both in a horizontal direction and vertical direction.

Similarly, for purposes of the present invention, the term "track" may be a unitary member or multiple components secured together. The present invention is not intended to be limited to the tracks like those illustrated and described herein. For example, a "track" may comprise a groove in one or more walls of a container. The term "track" is intended to include any number of stationary objects along which support members or support member assemblies as defined and/or illustrated herein may slide or move during the loading or unloading of products from dunnage inside the container.

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Tracks, like those disclosed in U.S. patent application Ser. No. 13/225,835, published as U.S. Patent Publication No. US2013/0057135, fully incorporated by reference herein, may be used to support the support member assemblies and associated dunnage for movement inside the container.

According to another aspect of the present invention, the container has a metal frame having a base and at least two sides. Tracks are secured to opposed sides of the metal frame, each of the tracks having at least one generally horizontally oriented portion and at least one generally vertically oriented portion which remain fixed during the loading and unloading of products. Each generally vertically oriented portion may extend downwardly from an end of the generally horizontally oriented portion of each track. Each of the stationary generally “L”-shaped tracks may have a curved or arcuate corner having a radius. Each of the tracks may be made of any number of pieces of material or be a unitary piece.

A plurality of support member assemblies is located generally inside the container. Each of the support member assemblies may comprise a pair of sliders or end members movable along the stationary tracks and a support extending between the sliders. Dunnage is supported by the support member assemblies. The dunnage may be pouches or any other known dunnage. The dunnage may be secured to the support member assemblies in any known manner, including those disclosed in U.S. patent application Ser. No. 13/225, 835.

The container may also include at least one space limiter attached to the dunnage to limit the distance adjacent support member assemblies may be moved or separated from each other. Each space limiter may be a fabric strap or like component that can flex when the distance between the support member assemblies is minimized and yet only stretch a predetermined distance to allow the support member assemblies to move a predetermined distance apart from each other. Space limiters or straps may be located on opposite sides of the container so two straps connect front and rear walls of a pouch or adjacent pouches. The straps may be made of the same material as the dunnage, or may be any other suitable material.

According to another aspect of the invention, the container comprises a metal frame having a base and at least two sides extending upwardly from the base. Tracks may be secured to opposed sides of the frame, each track comprising a generally horizontally oriented portion and at least one generally vertically oriented portion. Each generally vertically oriented portion may extend downwardly from an end of the generally horizontally oriented portion of each track.

In some embodiments, the container has a movable door on one side of the container which may be lowered for ergonomic reasons. An operator may find loading and/or unloading parts from the dunnage in the container to be easier and less stressful on his/her body when the door is in a lowered position. Alternative containers may have two doors on opposite sides of the container. Each of the doors, regardless of whether the container has one or two doors, may comprise multiple panels, at least one of which may be movable.

In the situation in which each side of the container has a track having two generally vertically oriented portions extending downwardly from opposite ends of a generally horizontal portion of the track, the container could have two doors. In such a container, each of the stationary generally “U-shaped” tracks may have curved or arcuate corners, each corner having a radius. The container further comprises support member assemblies supported by the tracks and extending therebetween. Each of the support member assemblies comprises a pair of end members engaged with and movable

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along the tracks and a support extending between the end members, the support surrounding a portion of each of the end members. The container further comprises dunnage supported by the support member assemblies.

According to another aspect of the invention, the container comprises a metal body. Stationary tracks, supported by the metal body of the container, may comprise at least one generally horizontally oriented portion and at least one generally vertically oriented portion. The container may further comprise movable support member assemblies supported by the stationary tracks and extending therebetween. Each of the support member assemblies may comprise a pair of sliders or end members engaged with and slidable along the tracks and a tubular support extending between the sliders, the tubular support surrounding a portion of each of the sliders. The elongate tubular support may be secured to sliders at the ends thereof. The tubular support may be made of metal, such as aluminum; but may be made of any other suitable material, such as plastic. The container further comprises dunnage supported by the support member assemblies.

According to another aspect of the invention, the container comprises at least one slidable or movable door. Each door may comprise one or more panels or segments. In some embodiments, the dunnage may be attached to the door or doors.

The container may be adapted so that an operator located at the front of the container may pull product to be emptied from the rear of the container forwardly to a more ergonomically friendly position after products suspended from dunnage at the front of the container have been unloaded or removed. Thus, a person unloading the container from the front or proximal location of the container will not have to stretch or reach to the back of the container to unload remaining product.

Similarly, a person loading the container from the front of the container need not stretch or reach to the back of the container to insert or load product into the container. The loader of the container may push the support member assemblies and associated dunnage loaded with product rearwardly and load additional product in a more ergonomically friendly position or manner. For example, after product is loaded into dunnage suspended by adjacent support member assemblies, these support member assemblies and associated dunnage are pushed rearwardly to enable the loader to load additional product. Thus, the container allows product to be more efficiently and safely removed from the container or inserted therein without unnecessary stress or strain on the operator.

The sliders or end members may be made of plastic or any other desired material. The sides of the container have horizontally oriented track portions in which the sliders move to move dunnage supported by the support member assemblies closer to the user for loading or unloading product. Each slider may have at least one head located inside the interior of the track so the slider remains engaged with the track. The slider may have another head outside the track for preventing the dunnage material from entering the interior of the track.

The horizontally oriented tracks may have openings therein and removable caps for covering and/or closing the openings. If one or more of the supports or support member assemblies needs to be removed or inserted, a person may remove and/or insert one or more support member assemblies via the openings in opposed tracks.

In some embodiments having a single door, the generally vertically oriented track portions may be located at the front of the container only proximate the door. In such embodiments, the container has two generally vertically oriented track portions, one on each side of the container. Alterna-

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tively, in some embodiments, the containers may have two doors and generally vertically oriented track portions proximate each door. In such embodiments, the container has four generally vertically oriented track portions, two on each side of the container.

In either case, the generally vertically oriented track portions provide a mechanism for one of the support member assemblies supporting a wall of a dunnage pouch to move downwardly out of the way of the loader/unloader. With the front support member assembly lower than the rear support member assembly supporting a dunnage pouch, the loader/unloader has an easier time loading or unloading a product into or out of the dunnage pouch because he or she does not have to lift the product as far in a vertical direction. This capability of the container to ease the loading or unloading procedure may reduce the number of injuries and down time and thus, save costs. The drop down door or doors and L-shaped or U-shaped tracks inside the container allow parts to be removed from inside the container with minimal lifting, making the process of unloading a container easier and less stressful on the operator's body than previously known. Similarly, such configurations of containers make the process of loading a container with parts for shipment easier and less stressful on the operator's body than using previously known containers.

The ease of operation and other objects and advantages of the present invention shall be made apparent from the accompanying drawings and the brief description thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with a general description of the invention given above and the detailed description of the embodiments given below, serve to explain the principles of the invention.

FIG. 1 is a perspective view of one embodiment of a reusable and returnable container;

FIG. 2 is a cross-sectional view taken along the line 2-2 of FIG. 1 showing products being suspended by a plurality of pouches;

FIG. 2A is a cross-sectional view like FIG. 2 showing an alternative form of dunnage inside the container of FIG. 1;

FIG. 3A is a partial cross-sectional view of the container shown in FIGS. 1 and 2, the door being shown in a lowered or dropped position;

FIG. 3B is a partial cross-sectional view of the container shown in FIG. 1, the front slider assembly being shown in a lowered or dropped position;

FIG. 3C is a partial cross-sectional view of the container shown in FIG. 1, showing the front product being removed;

FIG. 3D is a partial cross-sectional view of the container shown in FIG. 1, the second slider assembly being shown in a lowered or dropped position;

FIG. 4 is an enlarged view of the encircled area 4 of FIG. 1;

FIG. 4A is a view taken along the line 4A-4A of FIG. 4;

FIG. 4B is a cross-sectional view of a portion of an alternative support member assembly;

FIG. 5 is an enlarged view of the encircled area 5 of FIG. 1 and FIG. 5A is a view like FIG. 5 showing another dunnage support member;

FIG. 6 is a perspective view of an alternative embodiment of reusable and returnable container;

FIG. 7 is a cross-sectional view taken along the line 7-7 of FIG. 6 with products shown in the pouches;

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FIG. 8A is a partial cross-sectional view of the container shown in FIG. 6, the door being shown in a raised or up position;

FIG. 8B is a partial cross-sectional view of the container shown in FIG. 8A, the door being shown in a lowered or dropped position;

FIG. 9 is a perspective view of an alternative embodiment of a reusable and returnable container having two doors;

FIG. 9A is a view taken along the line 9A-9A of FIG. 9 with products shown in the pouches;

FIG. 10 is an enlarged view of a portion of a container showing a bump at the front of one of the horizontal tracks;

FIG. 11 is a perspective view of another embodiment of the reusable and returnable container;

FIG. 12 is a cross-sectional view taken along the line 12-12 of FIG. 11 with products shown in the pouches;

FIG. 13A is a partial cross-sectional view of the container shown in FIG. 11, the door being shown in a lowered or dropped position;

FIG. 13B is a partial cross-sectional view of the container shown in FIG. 11, showing the front product being removed;

FIG. 13C is a partial cross-sectional view of the container shown in FIG. 11, the front slider assembly being shown in a lowered or dropped position;

FIG. 13D is a partial cross-sectional view of the container shown in FIG. 11, showing a second product being removed;

FIG. 13E is a partial cross-sectional view of the container shown in FIG. 11, a second slider assembly being shown in a lowered or dropped position;

FIG. 14 is a perspective view of another embodiment of the reusable and returnable container;

FIG. 15 is a cross-sectional view taken along the line 15-15 of FIG. 14 with products shown in the pouches;

FIG. 16 is a perspective view of another embodiment of the reusable and returnable container;

FIG. 17 is an enlarged perspective view of a portion of the container of FIG. 16 showing a locking mechanism for the door;

FIG. 18 is an enlarged perspective view of a portion of the container of FIG. 16 showing the door partially lowered;

FIG. 19 is an enlarged perspective view of a portion of the container of FIG. 16 showing the door fully lowered;

FIG. 20 is an enlarged perspective view of a portion of an alternative container showing the door partially lowered;

FIG. 21 is an enlarged perspective view of a portion of the container of FIG. 20 showing the door locked in a raised position;

FIG. 22 is an enlarged perspective view of a portion of an alternative container showing a corner of a continuous track;

FIG. 23 is a perspective view of an alternative embodiment of a reusable and returnable container having two doors;

FIG. 24 is a cross-sectional view taken along the line 24-24 of FIG. 23 with products shown in the pouches;

FIG. 25 is a rear perspective view of an alternative embodiment of container showing a different type of track and a different type of support member assembly;

FIG. 26 is an enlarged view of a portion of two support member assemblies and associated dunnage of the container of FIG. 25;

FIG. 27 is a cross-sectional view taken along the line 27-27 of FIG. 26;

FIG. 28 is a cross-sectional view of an alternative shape of track and end member;

FIG. 29 is a perspective view of another embodiment of reusable and returnable container incorporating a metal frame or rack;

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FIG. 30 is a perspective view of the metal frame of the container of FIG. 29;

FIG. 31 is a perspective view of the metal frame and guide assembly of the container of FIG. 29;

FIG. 32 is a partially dissembled view of a portion of the container of FIG. 29;

FIG. 33 is a partially dissembled view of a portion of the container of FIG. 29;

FIG. 34 is a cross-sectional view taken along the line 34-34 of FIG. 29 with products shown in the pouches;

FIG. 35 is a partially dissembled view of a portion of the container of FIG. 29;

FIG. 36 is a partially dissembled view of a portion of the container of FIG. 29;

FIG. 37 is a partially dissembled view of a portion of another embodiment of reusable and returnable container incorporating a metal rack; and

FIG. 38 is a partially dissembled view of a portion of another embodiment of reusable and returnable container of FIG. 37.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, there is illustrated a reusable and returnable container 10 according to one embodiment. The reusable and returnable container 10, as shown, comprises a body 12 having a base 14, opposed side walls 16 and a rear wall 18, all extending upwardly from the base 14. The side walls 16 and/or rear wall 18 may be hingedly secured to the base 12. A generally U-shaped front frame 20 may be fixedly secured to the side walls 16 and does not move relative to the side walls 16 after the container is assembled. The front frame 20 may be made of metal or any other suitable material.

As shown in FIG. 2, a bumper 17 may be secured to each of the side walls 16 (only one being shown). Each bumper 17 functions to protect the products 40 from contacting the side walls 16 and being scratched or damaged in some fashion. The bumpers may be made of foam or any other suitable material. If desired, the bumpers may be omitted.

Although one specific shape of product 40 is illustrated in the drawings, this document is not intended to limit in any way the size, shape or configuration of product 40 shipped or stored in any of the embodiments described or shown herein. One type of product which may be used in accordance with the present invention is car door panels.

Although one type of container is illustrated, the present invention may be used with other types or configurations of container. For example, each side wall may not be a solid wall.

As best shown in FIG. 1, the front frame 20 comprises a frame base 22 and two side posts 24 extending upwardly from the frame base 22. The frame base 22 is fixedly secured to the base 14 of the container 10 with rivets or fasteners 21, while the side posts 24 of the front frame 20 are secured to the container side walls 16.

Each of the side posts 24 of the front frame 20 is generally rectangular in cross-section and has a hollow interior 25. Each of the side posts 24 of the front frame 20 has two slots therethrough, an upper slot 26 and a lower slot 28. However, any number of slots of any desired shape may be incorporated into the side posts. As best shown in FIGS. 3A-3D, upper slot 26 has a "candy cane" shape comprising a straight portion 30 and a curved upper portion 32. The lower slot 28 is linear, as best illustrated in FIG. 2. These upper and lower slots 26, 28 are used to secure a movable door 34 in a fixed position and guide the door 34 during its movement from an upper or raised position and a lower or dropped position. As best

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shown in FIGS. 2 and 3A-3D, the door 34 has a pair of upper pins 36 extending outwardly from the door 34 and adapted to ride or move inside the upper slots 26. Similarly, the door 34 has a pair of lower pins 38 extending outwardly from the door 34 and adapted to ride or move inside the lower slots 26. FIG. 2 shows the door 34 locked in a raised position with the upper pins 36 located at the upper ends of the curved portions 32 of the upper slots 26. As the door 34 is lowered, it moves outside a shield 42 secured with rivets or fasteners 41 to a vertically oriented flange 44 of the base 22 of the front frame 20. See FIG. 2.

As best shown in FIG. 1, a pair of spaced stops 45 are secured to door 34. The stops 45 may be made of foam or any other suitable material. When the door 34 is in its raised position, stops 45 function to prevent the support member assemblies and associated dunnage from sliding down the vertically oriented tracks from the horizontally oriented tracks. The stops 45 also function to prevent products 40 from hitting the door 34 during the loading or unloading process. Although two stops 45 are illustrated per door 34, a continuous stop or a different number of stops may be utilized of any desired configuration or size.

As best shown in FIG. 2, container 10 further comprises a generally "L-shaped" track 5 secured to each side wall 16 of the container 10, which does not move relative to the side wall 16 after the container 10 is assembled and during the loading or unloading processes (only one being shown in FIG. 2). Each "generally L-shaped" track 5 comprises a generally horizontally oriented track portion 46 and a generally vertically oriented track portion 60, each being fixedly secured to a side wall 16 of the container 10. Each "generally L-shaped" track 5 may be constructed of several pieces or may be a unitary piece. As shown in FIG. 4, each generally horizontally oriented track portion 46 and each generally vertically oriented track portion 60 has an upper wall 48, a lower wall 50 joined to the upper wall 48 by a side wall 52, and a lip 54 extending downwardly from the upper wall 48 and another lip 56 extending upwardly from the lower wall 50 defining an interior 58 of the track 46.

As best shown in FIGS. 3A-3D, generally vertically oriented track portion 60 of "generally L-shaped" track 5 is also fixedly secured to each side wall 16 of the container 10. The generally vertically oriented track portion 60 and generally horizontally oriented track portion 46, each being fixedly secured to the side walls 16 of the container 10, do not move after the container 10 is assembled and do not move relative to the side walls 16 of the container 10 during the loading or unloading of parts or products. On each side of the container, the top of the generally vertically oriented track portion 60 may connect or communicate with the front end of the generally horizontally oriented track portion 46 at corner 62. The generally vertically oriented track portion 60 may be the same construction and/or material as the horizontally oriented track portion 46, or they may be slightly different. The interior 58 of the generally horizontally oriented track portion 46 connects with the interior of the generally vertically oriented track portion 60 so that one of the support member assemblies 66 may move along a continuous path in both a horizontal and vertical direction. The generally horizontally oriented track portion 46 and generally vertically oriented track portion 60 may be separate pieces welded or joined together, or may be a unitary generally "L-shaped" piece of track fixedly secured to each of the side walls 16. In either event, a corner piece 64 may be welded or otherwise secured to each corner 62 to prevent the end members or portions of the support member assemblies 66 from coming out of the tracks at the corner.

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Referring to FIG. 4, container 10 further comprises a plurality of support member assemblies 66 extending between the tracks of opposed side walls 16. Each support member assembly 66 includes a pair of sliders or end members 68 and a tubular support 70 having a hollow interior 72 extending

therebetween. The sliders 68 are preferably made of injection molded plastic, such as nylon, but may be made of any other material. The tubular support 70 is preferably made of metal, but may be made of other suitable material, such as plastic. As shown in FIG. 4, each slider 68 preferably has a first portion 74 having an X-shaped cross-sectional configuration and a second portion 76 having a circular cross-sectional configuration. Although one configuration of slider 68 is illustrated, any type or configuration of slider may be used with the present invention. In this embodiment, each slider 68 has a pair of heads 78, 80 at the end of the slider 68. Head 78 is furthest from the first portion 74 of the slider 68, and head 80 is spaced inwardly from head 78. The heads 78, 80 are spaced from one another to define a groove 82 therebetween which receives and retains the lips 54, 56 of the stationary tracks 46, 60. As shown in FIG. 4, head 78 is located inside the interior 58 of tracks 46, 60 and head 80 is located outside the interior 58 of stationary tracks 46, 60. Head 78 keeps the slider 68 engaged with the tracks 46, 60 while head 80 keeps the dunnage material out of the interior 58 of the tracks 46, 60, thereby ensuring that the sliders 68 may move smoothly along the stationary tracks. Although one configuration of support member assembly 66 is illustrated, the present invention may be used with any type or configuration of support member assembly for supporting dunnage so the dunnage may slide or move inside the container.

As shown in FIG. 4, each end of tubular support 70 fits over at least the first portion 74 of a slider 68. An end surface 84 of tubular support 70 abuts head 80 of slider 68. Each end member or slider 68 of each support member assembly 66 is adapted to engage and move along one of the tracks. The end members 68 preferably slide along the length or width of the tracks; however, different end members may rotate rather than slide along the tracks. Although one configuration of track and end member is shown and described, other types of end members and tracks may be used if desired.

As best shown in FIG. 4A, support member assembly 66 includes a pair of sliders 68 (only one being shown in FIG. 4A). Each slider 68 has a groove 86 formed in a second portion 76 therein. Support member assemblies 66 further include a tubular support 70 having a hollow interior 72 extending therebetween. The tubular support 70 is preferably made of metal, but may be made of other suitable material, such as plastic. As shown in FIG. 4A, each end of tubular support 70 fits over at least the first portion 74 of a slider 68. An end surface 84 of tubular support 70 abuts head 80 of slider 68. As shown in FIG. 4A, tubular support 70 has two detents 89 therethrough (one at each end) in which the material of the tubular support is pressed downwardly into the groove 86. This attachment between each of the two sliders 68 and the tubular support 70 enables some movement therebetween. Such interaction between the sliders 68 and tubular support 70 allows for a tolerance of approximately one-quarter inch on each side. The detents 89 prevent separation of the tubular support 70 from the sliders 68 while allowing some movement therebetween as the detents 89 move within the grooves 86 formed in the sliders 68.

As shown in FIG. 4B, a slightly different support member assembly 66', including a pair of sliders 68 (only one being shown in FIG. 4B), may be used. Support member assembly 66' is slightly different than support member assembly 66 shown in FIG. 4A and described above. As shown in FIG. 4B,

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the only difference between support member assembly 66' and support member assembly 66 shown in FIG. 4A is that tubular supports 70' are slightly different than the tubular supports 70; they lack detents 89. See FIG. 4A. Each support member assembly 66' includes a tubular support 70' having a hole 88 at each end. The tubular support 70' is preferably made of metal, but may be made of other suitable material, such as plastic. As shown in FIG. 4B, each end of tubular support 70' fits over at least the first portion 74 of a slider 68. An end surface 84 of tubular support 70' abuts head 80 of slider 68. As shown in FIG. 4B, tubular support 70' has holes 88 therethrough, which receive fasteners 90. Although fasteners 90 are shown as screws, they may be any other type of fasteners. The fasteners 90 prevent separation of the tubular support 70' from the sliders 68 while allowing some movement therebetween as the fastener 90 moves within the grooves 86 formed in the sliders 68. Other known means of securing the tubular support 70 to the sliders 68 may be used if desired.

FIGS. 1 and 4 illustrate all of the support member assemblies 66 having detents 89, as shown in FIG. 4A. Alternatively, containers may be made with all of the support member assemblies having fasteners, like support member assemblies 66'. Alternatively, some of the support member assemblies may have fasteners like support member assemblies 66', and some may have detents like support member assemblies 66. Alternatively, as shown in FIG. 5A, unitary support members such as support member 66" may be used. Containers may have a mixture thereof.

FIG. 5 illustrates another support member assembly 66, exactly like the one shown in FIG. 4A, used to support one of the pouches. However, FIG. 5 illustrates another innovative feature or aspect of the invention. Track portion 46 has an opening or cut-out 92 formed therein. Holes 94 are formed in the upper wall 48 of track portion 46, which are sized and threaded to receive fasteners 96. Although fasteners 96 are illustrated to be screws, they may be any other desirable fastener. A cap 98 is removably secured to the track portion 46 to cover the opening or cut-out 92 formed in an upper portion of track portion 46. As best seen in FIG. 5, cap 98 has a generally inverted U-shaped cross-sectional configuration, including a top portion 100 and side portions 102 extending downwardly from the top portion 100. Holes 104 are formed through the top portion 100 of the cap 98 and sized to receive fasteners 96, as shown in FIG. 5. The fasteners 96 are adapted to pass through the holes 104 in the cap 98 and into the holes 94 in the upper wall 48 of the track portion 46. Caps of alternative shapes or sizes may be used if desired.

When one of the sliders 68 or any part of support member assemblies 66, 66' are damaged or need to be replaced for any reason, one may remove cap 98 after loosening fasteners 96, thereby exposing the opening or cut-out 92 of track portion 46. The support member assemblies 66, 66' may then be removed or inserted as necessary to repair or replace the damaged part or parts.

As best shown in FIG. 2, dunnage 106 in the form of a plurality of pouches 108 are suspended by and supported by a plurality of support member assemblies 66. Each pouch 108 has a front wall 109, a rear wall 111 and a bottom 113 extending therebetween. As shown in FIG. 2, the top of the front wall 109 is attached to one of the support member assemblies 66 and the rear wall 111 being attached to an adjacent support member assembly 66. Although the dunnage 106 shown comprises pouches, the dunnage may assume other shapes or configurations. A pouch 108 is supported by two adjacent support member assemblies 66. As shown in FIG. 4, the fabric of the pouch 108 is sewn or otherwise

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secured together along a seam 110 to make a pocket 112 in which is located a tubular support 70 of the support member assembly 66.

Support member assemblies 66 supporting pouches 108 are adapted to move from back to front inside the interior of the container 10, the end members or sliders 68 of the support member assemblies 66 moving along the stationary tracks 5 in generally horizontal and generally vertical directions.

Multiple pouches 108 may be formed or created from one piece of material draped or laying over and secured to the support member assemblies 66. Alternatively, each pouch 108 may be made from its own piece of material, in which case, the pouches 108 would not be interconnected other than via the straps or space limiters 114.

The reusable and returnable container 10 may also have at least one space limiter or strap 114 which, as shown in FIGS. 2 and 3A-3D, limits the distance the support member assemblies 66 may be moved away from one another due to the fact that each space limiter 114 is secured to the dunnage of adjacent support member assemblies 66. Typically, the length or distance of the space limiter 114 between locations where the space limiter 114 is secured to the dunnage will be fixed to prevent the support member assemblies 66 from moving farther apart than necessary for the insertion or removal of product 40 into or from the pouches. The space limiter 114 may be secured to the dunnage 106 in any suitable fashion including, but not limited to, sewing, fastening, etc. Of course, when the support member assemblies 66 are moved to a position adjacent to one another, the flexibility of the space limiters 114 allows for such movement. The space limiter 114, as shown, is preferably comprised of a fabric strap, but may be made of any other suitable material, such as plastic. Preferably, two space limiters or straps 114, one on each side of a pouch 108, connect adjacent walls 109, 111 of a pouch 108. However, any number of straps 114 may be used to connect any number of pouches.

As shown in FIG. 2A, straps 114 may be omitted and replaced with two side sewn locations 172 (only one being shown in FIG. 2A). Each pouch 108 has two sewn locations 172 on opposite sides of the pouch 108, thereby enabling the product 40 to be inserted or removed as desired. Each sewn location 172 comprises the front and rear walls 109, 111 of pouch 108 being sewn together at a specific location.

FIGS. 3A-3D illustrates a method of unloading product 40 from the pouches 108 of the container 10. The method comprises the step of lowering door 34 from a raised and locked position shown in FIG. 2 to a lowered or dropped position illustrated in FIG. 3A. As shown in FIG. 3A, when the door 34 is in a lowered position, an opening having a height H_1 is created above the door 34. The next step comprises moving the first support member assembly 66 forwardly, the sliders 68 sliding in the stationary generally horizontally oriented track portions 46, and then down the stationary generally vertically oriented track portions 60 until the straps 114 extending between the front and rear walls of the front pouch 108 are stretched and generally linear, as shown in FIG. 3B. At this point, the product 40 in the forwardmost or front pouch 108 is still in the front pouch 108, as shown in FIG. 3B. As shown in FIG. 3C, the product 40 in the front pouch 108 is then removed by the operator in the direction shown by arrow 116 over the front door 34. Thus, the front product 40 being removed passes between the partially lowered or dropped first support member assembly 66 and the second support member assembly 66, which is still extending between the generally horizontally oriented track portions 46. As shown in FIG. 3C, the lowered position of the front door 34 makes it easier from an ergonomic standpoint for the operator to remove the prod-

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uct 40 because the product 40 need not be raised over the full height of the container 10 to be removed from inside the container. FIG. 3D illustrates the second support member assembly 66 extending between the stationary generally vertically oriented track portions 60 above the front support member assembly 66, the straps 114 extending between the front and rear walls of the second pouch 108 being stretched and generally linear. The front support member assembly 66 is spaced above the bottom of the container by a bottom stop 118. With the second support member assembly 66 extending between the vertically oriented tracks 60 as shown in FIG. 3D, the product 40 in the second pouch 108 may be easily removed like the front product 40 was removed. This process is continued by an operator until all the products 40 are removed from the pouches 108 and each of the support member assemblies 66 extend between the generally vertically oriented track portions 60. The empty container 10 still having the dunnage therein is then shipped back to its desired location for loading additional products. During the unloading or loading process, the tracks 5 remain stationary fixedly secured to the container side walls 16; it is the support member assemblies 66 and dunnage 106 hanging from the support member assemblies 66 which move inside the container with the assistance of an operator. The loading process is the reverse.

FIGS. 6, 7, 8A and 8B illustrate an alternative embodiment of container 10a. Container 10a has a stationary U-shaped front frame 20a fixedly secured to the container side walls 16. In this embodiment, the front frame 20a comprises a base 22a and two side posts 24a extending upwardly from the frame base 22a. The frame base 22a is fixedly secured to the base 14 of the container 10a with rivets or fasteners 21, while the side posts 24a of the front frame 20a are fixedly secured to the container side walls 16. During the loading or unloading processes described herein, the front frame 20a does not move.

Each of the side posts 24a of the front frame 20a is generally rectangular in cross-section and has a hollow interior 25a. Each of the side posts 24a of the front frame 20a has two slots therethrough; an upper slot 26a and a lower slot 28a. As best shown in FIGS. 7, 8A and 8B, upper slot 26a has a "candy cane" shape comprising a straight portion 30a and a curved upper portion 32a. The lower slot 28a is not linear, but rather has a "Z" shape, as best illustrated in FIG. 7. These upper and lower slots 26a, 28a are used to secure a movable multi-segmented or multi-piece door or door assembly 34a in a fixed position and guide the door assembly 34a during its movement from an upper or raised position and a lower or dropped position.

As best shown in FIGS. 7 and 8A-8B, the movable door assembly 34a comprises a movable upper segment 120 and a movable lower segment 122 which are not connected together. As shown in FIG. 7, the upper segment 120 has a flange 124 at the bottom thereof. The upper segment 120 has a pair of upper pins 36a extending outwardly from the upper segment 120 of the door assembly 34a and adapted to ride or move inside the upper slots 26a. In addition, the upper segment 120 of the door assembly 34a has an integral U-shaped upper handle 128 which a user may easily grasp and move the upper segment 120 of the door assembly 34a along with the lower segment 122 of the door assembly 34a due to the configuration of the door assembly 34a. Similarly, the upper segment 120 of door 34a has a pair of lower pins 38a extending outwardly from the upper segment 120 of door assembly 34a and adapted to ride or move inside the lower slots 28a. FIG. 7 shows the door assembly 34a locked in a raised posi-

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tion with the upper pins 36a located at the ends of the curved portions 32a of the upper slots 26a.

The lower segment 122 of door assembly 34a is not fastened or secured to any particular piece and is free floating between the generally vertically oriented track portions 60 and the upper segment 120 of door assembly 34a. The lower segment 122 of door assembly 34a has a U-shaped lip 126 located at the upper end of the lower segment 122. The lower segment 122 of door assembly 34a moves inside a stationary vertically oriented flange 43 of the base 22 of the front frame 20a. As the door 34a is lowered, the lower segment 122 of door assembly 34a moves inside a flange 43 of the base 22a of the front frame 20a. As the door assembly 34a is raised, the flange 124 of the upper segment 120 of door assembly 34a contacts the U-shaped lip 126 located at the upper end of the lower segment 122 and raises the lower segment 122 of door assembly 34a.

When the door assembly 34a is in its lowered position shown in FIG. 8B, an opening having a height H_2 is created above the door assembly 34a. The height H_2 of the opening is greater than the height H_1 of the embodiment shown in FIGS. 1 and 2 (approximately half the height of the container). Thus, the opening H_2 is greater than half the height of the container H_1 , making it more desirable from an ergonomic standpoint for the loader/unloader.

FIG. 9 shows another alternative embodiment of container 10b. This container 10b has two doors 34a on opposite sides of the container. Each door 34a is like the door 34a shown in FIGS. 6, 7, 8A and 8B. Any of the containers shown or described herein may have two doors and two generally vertically oriented stationary track portions attached to each side wall of the container and extending downwardly from a generally horizontally oriented track portion, one generally vertically oriented track portion being proximate each of the doors.

FIG. 9A shows the interior of container 10b. On each side of the container, rather than one stationary generally vertically oriented track portion 60, two stationary generally vertically oriented track portions 60 extend downwardly from the ends of a stationary generally horizontally oriented track portion 46 to create a generally "U-shaped" track 7 fixedly secured to each side wall 16 (only one being shown in FIG. 9A). With such an interior, support member assemblies 66 with dunnage may be moved towards either end of the container to load or unload products from either end of the container over a lowered door, the support member assemblies 66 moving along either one or both of the stationary vertically oriented tracks 7.

FIG. 10 shows a feature of container 10 which may be used in any embodiment or container shown or described herein. This feature comprises a bump 130 at one end of the stationary horizontally oriented track 46. The purpose of the bump 130 is to prevent support member assemblies 66 from accidentally passing from the generally horizontally oriented track portion 46 to the stationary generally vertically oriented track portion or portions 60. Containers having two generally vertically oriented track portions 60 on each side of the container would have two bumps 130; one on each end of each generally horizontally oriented track portion 46, making a total of four bumps 130 per container.

FIGS. 11, 12 and 13A-13E illustrate an alternative embodiment of container 10c. Inside container 10c, the front edge of dunnage 106 is secured to door 34c. As best illustrated in FIG. 12, door 34c is identical to door 34a, except door 34c has a bar 132 around which the front edge of the front wall of the front pouch 108 is wrapped and sewn or secured. FIG. 12 shows the door 34c in a raised position, the front edge of the front pouch

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108 being secured to bar 132 of door 34c. Other than bar 132 of bar 34c and the dunnage being secured thereto, container 10c is identical to container 10 shown and described herein.

FIGS. 13A-13E illustrate a method of unloading product 40 from the pouches 108 of the container 10c. The method comprises the step of lowering door 34c from a raised and locked position shown in FIG. 12 to a lowered or dropped position illustrated in FIG. 13A. When the door 34c is down in its lowered position shown in FIG. 13A, the upper end of the front wall 109 of the front pouch 108 is below the rear of the front pouch 108. At this point, the product 40 in the front pouch 108 is still in the front pouch 108, as shown in FIG. 13A. As shown in FIG. 13B, the product 40 in the front pouch 108 is then removed from inside the front pouch 108 over the door 34c by the operator in the direction shown by arrow 134. Thus, the front product 40 being removed passes between the door 34c and the first support member assembly 66, which is still in the stationary generally horizontally oriented track portion 46. As shown in FIG. 13B, the lowered position of the door 34c makes it easier from an ergonomic standpoint for the operator to remove the product 40 because the product 40 need not be raised the full height of the container 10c. As shown in FIG. 13C, the next step comprises moving the first or front support member assembly 66 forwardly in the track portion 46 in the direction of arrow 136, the sliders 68 sliding in the stationary generally horizontally oriented track portions 46. As shown in FIG. 13D, front support member assembly 66 is then moved downwardly in the stationary generally vertically oriented track portions 60, the sliders 68 sliding down the generally vertically oriented track portions 60 until the straps 114 located in the second pouch 108 are stretched and generally linear. FIG. 13D illustrates the front support member assembly 66 extending between the generally vertically oriented track portions 60, the straps 114 extending between the first or front and second support member assemblies 66 being stretched and generally linear. FIG. 13E illustrates the second support member assembly 66, like the first support member assembly 66 extending between the generally vertically oriented track portions 60, the front support member assembly 66 is spaced above the bottom of the container by a bottom stop 118. With the second support member assembly 66 extending between the generally vertically oriented track portions 60, as shown in FIG. 13E, the product 40 in the third pouch 108 may be easily removed like the other product 40 in the other pouches were removed. This process is continued by an operator until all the product 40 are removed from their pouches 108, and each of the support member assemblies 66 extend between the generally vertically oriented track portions 60. The empty container 10c still having the dunnage therein is then shipped back to its desired location for loading additional products. The loading process is the reverse. During the unloading or loading process, the location of the track portions 46, 60 remains stationary; it is the support member assemblies 66 and dunnage 106 hanging from the support member assemblies 66 which move inside the container with the assistance of an operator. This process may be used in any of the containers shown or described herein, the dunnage being secured to one or two doors of the container.

FIGS. 14 and 15 illustrate an alternative embodiment of container 10d. As shown in FIG. 15, inside container 10d, the front edge of dunnage 106 in the form of pouches 108 for supporting products 40 is secured to door 34d. Door 34d is identical to door 34a, except door 34d has a bar 138 around which the front edge of the front pouch 108 is wrapped and sewn or secured. FIG. 14 shows the door 34d in a raised position, the front edge of the front pouch 108 being secured

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to bar 138 of door 34d. Other than bar 138 of door 34d and the dunnage being secured thereto, container 10d is identical to container 10a shown and described herein.

FIGS. 16-19 illustrate an alternative embodiment of container 10e. In container 10e, door 34e slides in stationary vertically oriented tracks 140 (one on each side wall) between a raised and locked position shown in FIGS. 16 and 17, and a lowered position shown in FIG. 19. As shown in FIG. 18, at the top of each track 140 is a hole 142 adapted to receive a pin 144 from a lock 146. A ring 148 is attached to pin 144 at each end of the door 34e. The locks 146, only one being shown, are located at the sides of the door 34e and move with the door 34e. A connector 150, which may be in the form of a wire or any other suitable material, extends between the rings 148. In order to disengage the pins 144 from inside the holes 142 and lower the door 34e, an operator may pull on the connector 150, thereby moving the pins 144 toward each other out of engagement with the holes 142. With the pins 144 no longer holding the door in an upward raised and locked position, the door 34e may be moved downwardly inside tracks 140 to the position shown in FIG. 19. Although FIGS. 16-19 illustrate container 10e having only one door 34e, this door 34e may be located on opposite sides of a container. In such a container, two tracks would be located inside the container, one for each door.

FIGS. 20 and 21 illustrate a container 10f having a door 34f having an additional feature which may be used to help hold door 34f in a raised and locked position. This feature comprises a movable finger 152, which may be located at the top of each track 140. The finger 152 is adapted to engage a slot 154 located at the top of the door 34e. This feature may be used in any of the containers described or shown herein.

FIG. 22 illustrates a unitary "L-shaped" track 155 having a rounded corner which is fixedly secured to one of the side walls 16. The unitary track 155 comprises a horizontal portion 156 and a vertical portion 158 connected by a curved portion 160. Although the unitary tracks 155 are illustrated in container 10e, they may be used in any of the containers illustrated or described herein. Such rounded corners may be used in any tracks described or shown herein and may be used in containers having one or two vertically oriented tracks.

FIGS. 23 and 24 illustrate an alternative embodiment of container 10g. Container 10g is a two-sided container having a U-shaped frame 20 fixedly secured to the container side walls 16 at each end of the container 10g which does not move during the loading or unloading of the container. In this embodiment, each frame 20 is identical to the frame disclosed in container 10. The container 10g has two movable doors 34, one at each end, identical to the door 34 shown in the embodiment of FIGS. 1 and 2.

Inside container 10g, a "U-shaped" unitary track 165 having a horizontal portion 166 and two vertical portions 168 connected by two curved portions 170, similar to the track shown in FIG. 22, is secured to each side wall 16 in a fixed, stationary position (only one being shown in FIG. 24). Support member assemblies 66, like those described herein and shown in other embodiments, may move inside container 10g in both a vertical and horizontal direction due to the location and configuration of tracks 165 on side walls 16. Such stationary tracks may be used in any container shown or described herein.

FIG. 25 illustrates an alternative embodiment of container 10h having only one door 34e configured and operational like the door shown in FIGS. 16-19. This embodiment of container 10h may use any door or features described or illustrated herein.

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This container 10h illustrates a different generally "L-shaped" track 174 attached to and spaced from each side wall 16 with fasteners 175 (only one track 174 being shown in FIG. 25). As shown in FIG. 25, each track 174 comprises a horizontal portion 176 and a vertical portion 178 joined by a curved corner 180. As shown in FIG. 27, each of the fasteners 175 extends through one of the side walls 16 and into a track rail 182 which is shown as circular in cross-section in FIGS. 26 and 27. However, as exemplified in FIG. 28, the track rail 182 may be rectangular or oval or any desired shape of cross-sectional configuration. FIG. 28 illustrates a track rail 183 having a rectangular cross-section secured to side wall 16 with fastener 175 in the same manner. The fasteners 175 space the track rail 182, 183 away from the inner surface of the side wall 16 to provide clearance for a portion of an end member or slider 184 to move past the fasteners 175. As best shown in FIG. 27, each slider 184 has a generally "C-shaped" portion 181 which partially surrounds the track rail 182 and an inward portion 76h. FIG. 28 illustrates a slider 185 having a slightly different configuration partially surrounding track rail 183.

In container 10h, each support member assembly 66h comprises two end members or sliders 184 attached to a tubular support 70 in any manner described herein. As best shown in FIG. 26, support member assembly 66h includes a pair of sliders 184 (only one being shown in FIG. 26). Each slider 184 has a groove 86 formed in a portion 76h therein. Support member assemblies 66h further include a tubular support 70 having a hollow interior 72 extending therebetween. As shown in FIG. 27, each end of tubular support 70 fits over at least one portion of a slider 184. As shown in FIG. 27, tubular support 70 has two detents 89 therethrough (one at each end) in which the material of the tubular support 70 is pressed downwardly into the groove 86 at each end. This attachment between each of the two sliders 184 and the tubular support 70 enables some movement therebetween. Such interaction between the sliders 184 and tubular support 70 allows for a tolerance of approximately one-quarter inch on each side. The detents 89 prevent separation of the tubular support 70 from the sliders 184 while allowing some movement therebetween as the detents 89 move within the grooves 86 formed in the sliders 184. This may be true no matter what the shape of the mating slider and track rail.

Although a generally "L-shaped" track 174 is shown and described, a generally "U-shaped" track like the track 174 may be used in any container described or shown herein. Any combination of features described or shown herein may be used in combination with any other features described or shown herein. For example, the container shown in FIG. 25 may have two doors and generally "U-shaped" tracks spaced from the side walls like tracks 174.

FIGS. 29-33 illustrate an alternative embodiment of container 10i. As best shown in FIG. 30, container 10i comprises an outer metal rack or frame 186 having a bottom 188 and four corner posts, two rear corner posts 190a and two front corner posts 190b. Each of the corner posts 190a and 190b is generally rectangular in cross-section, has a hollow interior, a knob 191 at the top thereof and a cap 189 at the bottom thereof for stacking purposes so that multiple containers 10i may be stacked upon one another. The knobs 191 of a first container fit inside the hollow interiors of the corner posts of another or second container located above the first container for stacking purposes. The metal frame 186 further comprises rear members 192, 193 extending between the two rear corner posts 190a. The rear members 192, 193 and rear corner posts 190a define a rear portion 194 of the metal frame 186, rear member

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193 being below two rear members 192. In some applications, the lower rear member 192 may be omitted for weight reduction.

The metal frame 186 further comprises, on each side of the container, side members 196, 198 and 200 extending between one of the rear corner posts 190a and one of the front corner posts 190b, the side members 196, 198 and 200 and corner posts 190a, 190b defining a side portion 202 of the metal frame 186. Side member 198 is below two side members 196, and side member 200 is below side member 198. In some applications, on each side, the lower side member 196 and member 198 may be omitted for weight reduction.

The bottom 188 of the metal rack 186 further comprises four perimeter members 204 defining a rectangle and a plurality of intersecting interior members 206 extending between opposed perimeter members 204, members 204 and 206 comprising part of the bottom 188 of the metal rack 186. Although four interior members 206 are shown in the bottom 188 of the metal rack 186, any number of interior members may be used. Similarly, although the rear and side portions 194, 202 of the metal rack 186 are illustrated as having a certain number of braces or members extending between corner posts, any number of braces or members may extend between corner posts of any desired shape or size.

As best shown in FIG. 31, container 10i further comprises a metal generally U-shaped door guide assembly 208 comprising two opposed door guides 210 and a panel 211 extending between the door guides 210 and welded thereto. The panel 211 has a bottom flange 213 which may be secured to the front perimeter member 204 of the bottom 188 of the metal rack 186 using welding or fasteners or any other known technique. For example, the bottom flange 213 of the panel 211 is illustrated having holes 215 through which fasteners may pass. Each door guide 210 has a flange 212 which has holes 214 therethrough so the door guide 210 may be secured via bolts or any other conventional manner to the outer frame 186.

Each of the door guides 210 has two slots therethrough, an upper slot 26a and a lower slot 28a just like the slots shown and described above. However, any number of slots of any desired shape may be incorporated into the door guides 210. As best shown in FIGS. 31 and 32, upper slot 26a has a "candy cane" shape comprising a straight portion 30a and a curved upper portion 32a. The lower slot 28a is not linear, but rather has a "Z" shape, like the lower slot illustrated in FIG. 7. These upper and lower slots 26a, 28a are used to secure a movable multi-segmented or multi-piece door identical to the multi-piece door assembly 34a having door segments 120, 122 shown and described herein, particularly in FIGS. 6-9A. These slots 26a, 28a guide the door assembly 34a during its movement from an upper or raised position and a lower or dropped position. If desired, the door guides 210 may have slots of other configurations shown and described herein, including the slot system, including slots 26, 28 shown in FIGS. 1-3D adapted to guide a door panel or assembly, such as the door panel 34 shown and described herein.

As best shown in FIG. 32, container 10i further comprises a generally "L-shaped" track 5 secured to each side portion 202 of the metal frame 186 of container 10i, which does not move relative to the side portion 202 of the metal frame 186 after the container 10i is assembled and during the loading or unloading processes (only one track 5 being shown in FIG. 32). Each "generally L-shaped" track 5 comprises a generally horizontally oriented track portion 46 and a generally vertically oriented track portion 60, the generally horizontally oriented track portion 46 being fixedly secured to one of the side members 196 of one of the side portions 202 of the outer

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frame 186 of container 10i and the generally vertically oriented track portion 60 being fixedly secured to at least one of the side members 196, 198, 200 of one of the side portions 202 of the outer frame 186 of container 10i. Each "generally L-shaped" track 5 may be constructed of several pieces or may be a unitary piece and may be constructed in accordance with any of the tracks shown or described herein.

As shown in FIG. 32, each of the tracks 5 has multiple plates 218 welded thereto for securing the different pieces of container 10i together. Each of the plates 218 has an opening 220 therethrough so a fastener may extend through the plate 218. For example, the track 5 shown in FIG. 32 has two plates 218 attached to the vertically oriented track portion 60 of track 5 and two plates 218 attached to the generally horizontally oriented track portion 46 of track 5. Any number of plates may be used; this document is not intended to limit the number of plates which are part of the track 5. FIG. 33 illustrates one side of container 10i partially assembled, the outer frame 186, door guide assembly 208 and track 5 being secured together.

As shown in FIG. 36, a floor or panel 222 resides on the bottom 188 of the metal rack 186 on the inside thereof. The floor 222 has four openings 224 at the corners thereof for drainage and/or handling purposes. The floor 222 may or may not be secured to the bottom 188 of the metal frame 186. The floor 222 is preferably made of plastic, but may be made of any desired material.

As shown in FIG. 35, a side piece or guard 226 is secured to each side portion 202 of the metal rack 186 on the inside thereof (only one being shown). Although preferably made of plastic, these members 226 may be made of any other suitable material. Fasteners 228 extend through openings 230 in the side piece 226, through the openings 220 in the plates 218 of the track 5 and are secured in place with a nut 232 for purposes of securing the side piece 226 to the track 5.

As best shown in FIG. 34, dunnage 106 in the form of a plurality of pouches 108 are suspended by and supported by a plurality of support member assemblies 66. Each pouch 108 has a front wall 109, a rear wall 111 and a bottom 113 extending therebetween. As shown in FIG. 34, the top of the front wall 109 is attached to one of the support member assemblies 66 and the rear wall 111 being attached to an adjacent support member assembly 66 in any manner described or illustrated herein. Although the dunnage 106 shown comprises pouches, the dunnage may assume other shapes or configurations. FIG. 34 illustrates straps or space limiters 114 extending between adjacent pouch panels or walls to facilitate load or unloading products 40 as described herein. FIG. 34 illustrates products 40 being secured inside the pouches 108, the products 40 being purely for illustrative purposes, as described above. Any embodiment described or illustrated herein may be used with products of different sizes or shapes. The illustrated products 40 are not intended to be limited to any particular size or shape in any of the embodiments.

If desired, as shown in FIG. 29, each of the dunnage walls may have a handle 234 sewn therein directly above each of the movable support member assemblies 66. This feature may exist in any of the embodiments shown or described herein.

FIGS. 37 and 38 illustrate an alternative embodiment of container 10j very similar to container 10i. For simplicity, like numbers represent like parts. Container 10j has an outer frame 186j which is identical to outer frame 186 of the embodiment of FIGS. 29-36 except for the two front corner posts. As best shown in FIG. 37, each of the two front corner posts 190j of outer frame 186j of container 10j has slots 26a, 28a identical to those described and illustrated in door guides

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210 of the container 10i for purposes of guiding movement of a door assembly like door assembly 34a. Therefore, container 10j lacks any door guides 210. In virtually all other respects, container 10j is identical to container 10i.

While various embodiments of the present invention have been illustrated and described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. The invention in its broader aspect is, therefore, not limited to the specific details, representative system, apparatus, and method, and illustrative example shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of the applicant's general inventive concept.

What is claimed is:

1. A container for holding product therein during shipment, the container comprising:

- a metal frame having a bottom and two sides;
- a generally L-shaped stationary track secured to each side of the metal frame, each of the generally L-shaped tracks having at least one substantially horizontally oriented portion and at least one substantially vertically oriented portion extending towards the bottom from each substantially horizontally oriented portion;
- a door guide having two sides, each side having multiple slots;
- a movable door having pins movable in the slots of the door guide, the door being movable between a raised position and a dropped position;
- a plurality of movable support members generally inside the container, each of the support members extending between the tracks and being slidable along the tracks; and

dunnage supported by the support members.

2. The container of claim 1 wherein each of the sides of the door guide has at least one slot having a curved portion.

3. The container of claim 1 wherein the dunnage comprises pouches.

4. The container of claim 1 wherein the container has an opening above the movable door when the movable door is in its dropped position, thereby allowing movement of products through the opening.

5. The container of claim 3 wherein the pouches are connected.

6. The container of claim 1 wherein each of the support members comprises multiple pieces.

7. The container of claim 1 wherein each of the support members comprises a pair of end members and a middle support between the end members.

8. The container of claim 1 wherein each of the support members is a unitary member.

9. The container of claim 2 wherein each door comprises multiple pieces.

10. A container for holding product therein during shipment, the container comprising:

- a metal frame comprising a base and at least two sides;
- stationary tracks secured to opposed sides of the metal frame, each of the tracks comprising at least one generally horizontally oriented portion and at least one generally vertically oriented portion extending towards the base from an end of each generally horizontally oriented portion;

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a door movable between a raised and locked position and a dropped position;

at least one stop secured to the door;

support members supported by opposed tracks and extending therebetween, each of the support members being engaged with and movable along the tracks; and

dunnage supported by the support members wherein the at least one stop prevents the support members from moving into the generally vertically oriented portions of the tracks from the generally horizontally oriented portions of the tracks when the movable door is in its raised and locked position.

11. The container of claim 10 wherein the container has an opening above the door when the door is in the dropped position.

12. The container of claim 11 wherein each door comprises multiple pieces.

13. The container of claim 10 wherein the dunnage comprises pouches.

14. The container of claim 13 wherein each of the support members comprises multiple pieces.

15. The container of claim 10 wherein each of the tracks has a rounded corner.

16. The container of claim 10 wherein each of the tracks comprises multiple pieces.

17. A container for holding product therein during shipment, the container comprising:

- a metal frame having a bottom;
- stationary tracks supported by the frame, each of the tracks comprising a generally horizontally oriented portion and at least one generally vertically oriented portion extending towards the bottom of the metal frame proximate an end of the generally horizontally oriented portion and terminating proximate the bottom;

a door movable between a raised and locked position and a dropped position;

a plurality of movable support members engaged with the tracks, each of the support members extending between the tracks and being adapted to move in the tracks wherein the support members are prevented from moving into the generally vertically oriented portions when the door is in the raised position; and

dunnage suspended by the support members.

18. The container of claim 17 wherein the dunnage comprises pouches hanging from the support members.

19. The container of claim 17 wherein at least some of the tracks have openings for removal of at least some of the support members.

20. The container of claim 17 wherein the container has an opening above the movable door when the movable door is in its dropped position thereby enabling movement of products through the opening.

21. The container of claim 17 wherein each of the support members has a pair of end members and a tubular support secured to each of the end members.

22. The container of claim 17 wherein the moveable door has multiple segments, each of the segments being vertically movable.

23. The container of claim 17 wherein each of the tracks has a rounded corner.

24. The container of claim 17 wherein each of the tracks comprises multiple pieces.

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